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[ORIGINAL COMMUNICATION.]

AN EXPERIMENT WITH PEPPERMINT PLANTS.

BY ALBERT M. TODD.

THE experiment which I wish to record was made for the purpose of determining what effect, if any, was produced upon the nature and quantity of the essential oil of peppermint, when the plants had been perfectly dried and exposed for a long time to atmospheric action prior to distillation, as compared to the product from plants distilled in the fresh, green state. It will be noticed that, of the two determinations, one is chemical, the other being more of practical interest to growers and manufacturers.

There are cultivated and distilled, on the average, annually in the United States, *about fifteen thousand tons* of peppermint plants, yielding about one hundred thousand pounds of essential oil.

The distillation of the oil can be effected with *threefold the rapidity* from the dry rather than from green plants. In well-dried plants the handling and transportation to the distillers of about one-third this immense weight can be avoided; but many growers, fearing that, if well dried, a material loss of oil results by diffusion in the atmosphere, cannot be prevailed upon to distil the plants other than in the green state. As the quantity of plants and the labor in connection therewith is so great, it will be seen that the settlement of this question is one of great practical interest.

As to the *chemical* side of the question, one particular determination which I wished to make was whether the opinion held by some chemists was correct, that the *crystallizing* tendency of the oil would be greatly increased by continued exposure to the atmosphere. I had no reason for supporting this theory; on the contrary, my experience was quite different, as oxidized and resinified samples invariably crystallize less easily than those more recently distilled. Probably their theory was founded on the fact that the mentha arvensis plants of Japan are exposed to atmospheric action longer than ours prior to distillation.

Upon a clear day in September, in the middle of the day, when no dew or moisture was present, two loads of peppermint plants were cut down side by side at the same time. Both loads were immediately raked up in the fresh state, containing all the natural juices of the plant, then drawn to the scales and weighed. One load was immediately distilled, the other load being spread upon the ground and dried for two days in the sun. At this time the plants had become freed from nearly every particle of moisture, the leaves being so dry and brittle as to break off quite readily in handling. This second load, which had thus been dried in the sun and open air, was now spread out in a loft and exposed to a further drying and the action of the atmosphere for a little over six months.

The first charge of peppermint, which was distilled in the green state, weighed 2,332 lbs. and produced 6 lbs. 9 oz. of essential oil, being one pound of oil for each 355.35 lbs. of plants, or 0.2814 per cent. After the second load had been dried and exposed to atmospheric action, as stated, for a little over six months, it was then taken from the loft and distilled. I would here say that all of the essential oil in the peppermint plant, as indeed in almost all, if not all, essential oil plants is obtained from the *leaves* and *blossoms;* and this load of plants being extremely dry, and having been handled over a number of times, lost in the handling some of its leaves and blossoms. However, in distilling, the yield was one pound of essential for each 362.5 lbs. of green plants, which slight loss—about 2 per cent in the amount of essential oil—is certainly to be accounted for fully by the portion of blossoms and leaves which rattled off in the numerous rehandlings. The charge of peppermint, which was thus fully dried, had shrunk *49.4 per cent* in its original weight.

It will thus be seen that, although the plants are very aromatic, both before and after cutting, *there is no perceptible loss of the essential oil* by *diffusion in the atmosphere*, the oil being so tightly held and "hermetically sealed," as it were, in its little prison cells, that a force greater than that existing in the atmosphere or the rays of the sun is necessary to free it. Indeed, I have noticed that the leaves which fall off from the plants in dry seasons, and remain upon the ground over winter, even though subjected to the action of rain and snows as well, are often found months afterward to be so strong that one would hardly suppose that any of the strength had passed off. It is known though in practical experience that, when the plants are once thoroughly dried and subjected to rains, the water carries off a portion of the oil, acting in that respect as a distilling power of low degree.

Now, as to the chemical determination made: The tendency of the oil to crystallize was not in any respect increased, the difference, if any, being so delicate as to admit of no positive measurement in degree. The specific gravity, however, of the oil produced from the plants which had been exposed to the atmosphere for a long time was found to be .013 greater than that of the oil which had been distilled in the fresh state. The action of the atmosphere upon the oil in the cells is thus similar to that produced upon the oil when exposed in partly filled vessels, in both cases increasing the specific gravity by the formation of an oxidized or resinified product heavier than the volatile and soluble portion. I would also say that the difference in specific gravity and oxidation *due to the atmospheric action* is really higher than indicated, for this reason: the insoluble resin exists principally in the stalks and stems of the plants, which, being of compact texture, cannot be readily penetrated by the steam, so that in quick distillation, in the case of dry plants, very little is carried off and recovered. In the case of green plants, the long continued distillation is sufficient to allow the steam to dissolve and carry it over.

In demonstration of this, I have observed that the last portion of natural essential oil coming from a charge of plants is more resinous than the first portion, following in this respect the laws of fractional and redistillation, in which the last fraction recovered is more resinous than the preceding ones, the ultimate fraction remaining in the still in the form of a solid and insoluble resin.

Further, as analogous to this, I would mention the fact that some distillers of *oil of wormwood*, wishing to make its adulteration more easy, distil the plants as long as possible in order to recover the resin, which renders the presence of a lighter colored and less bitter adulterant less easy to detect.

As a matter of observation through many years' experience in distillation, I would say that the quality of essential oil, when distilled from the plants which are well dried, *but which have not been exposed to atmospheric action for a long time*, is superior to that distilled from green plants, in the following respects: in flavor, in solubility, limpidity, and color; but long and continued exposure to atmospheric action will counterbalance the good effects which would otherwise be obtained through the quick distillation of the dry plant.

As to the boiling point and solubility, there was hardly any difference noticed; the natural conclusion, however, would be that the sample containing the greater proportion of resin would have a slightly higher boiling point.

The crystallizing tendency of the oil was not increased by exposure to the atmosphere, and, in other respects, so far as investigated, no material difference was shown in the tests of the two samples.

This experiment, combined with more extended experience in connection therewith shows:

1st. No loss of essential oil of peppermint through diffusion in the atmosphere is occasioned by thorough drying of the plants and prolonged exposure to atmospheric action prior to distillation.

2d. Such exposure does not increase the crystallizing tendency of the essential oil.

3d. A heavy and insoluble resinoid is produced by oxidation, increasing the specific gravity of the oil, and theoretically affecting the boiling point and solubility by raising the former and decreasing the latter.

4th. To obtain the best results as to the quality of oil produced and the facility of handling and distillation, the plants should be dried as thoroughly as possible without endangering the loss of leaves and blossoms; distillation should then take place as soon as convenient to prevent the formation of resin.

NOTTAWA, MICH., August 14th, 1886.

Spurious Michigan Oil of Peppermint.

MR. ALBERT M. TODD, of Nottawa, the well-known grower of peppermint and distiller of peppermint and other oils, has recently discovered that a spurious *Michigan* oil of peppermint has been sold in England, which, from its label, pretends to be manufactured at "Evart, Michigan County, U. S.," by a person whose surname is given as Boeken, while the Christian name is very indistinct. Regarding this fraud, Mr. Todd says:

Having resided in St. Joseph county all my life, and being personally acquained with every prominent peppermint grower in America, as well as every locality where peppermint is grown, I did not think that oil of peppermint could have been produced at Evart without my knowledge; yet, though the error on the label, as mentioned, as well as the nature of the contents of the bottle, both stamped the article as a fraud, to be doubly sure, I at once wrote to different authorities at Evart to ascertain "if any oil of peppermint had ever been bottled or manufactured there or in that vicinity, or if any person by the name of 'Boeken' had ever resided there," when I was assured by all the parties

with whom I corresponded that "there had never been a pound of oil of peppermint either manufactured or bottled at Evart, nor had any such person as Boeken ever resided there."

Mr. Todd has examined this oil and found it to contain 50 per cent of oil of turpentine, 43 per cent of an oil having the odor of oil of peppermint, and 7 per cent of solid resin.

The temperatures for the different fractions were taken with a thermometer specially treated and corrected at Yale observatory. The fraction which contained the 50 per cent turpentine collected, boiled at temperatures between 342° Fah. and 390° Fah.

The 43 per cent of oil was collected at temperatures between 390° and 567°; and when this temperature was reached, the oil collected in the condenser was so thick that it would not flow out when cooled.

The oil was again tested for its solubility with alcohol, when it was found not to be completely soluble, which would of course result from the amount of turpentine which it contained. The facts most plainly demonstrated are that this brand of oil is fraudulent, both as regards the name and signature of the pretended maker, the locality in which it is supposed to be produced, and the nature of the oil.

How to Make Lanolin.

GAWALOWSKI (*Rundschau*, Prag, 1876) proposes the following method for the preparation of lanolin: The wool washings are first passed through a fine sieve to get rid of mechanical impurities, and then through a convenient quantity of cut straw or sawdust; the solution is then treated with magnesium sulpnate, and the resulting magnesium soap, containing also the cholesterin, is collected, well washed with water, then drained, and allowed to dry by exposure to air. It is then treated with sufficient diluted hydrochloric acid to decompose the soap; a large excess of hydrochloric acid should be avoided, but sufficient added until a slight excess of acid is indicated, which is afterwards removed in the process.

The resulting fatty scum, consisting of fatty acids and cholesterin, is drained, and treated with petroleum-benzin in a closed vessel, slightly warmed to about 85° F. to aid solution, and then filtered through flannel in a closed filter-press. The petroleum-benzin is then driven off by evaporation or distillation, and to remove any remaining traces of hydrochloric acid the residue is treated with from one-tenth to one-quarter per cent of carbonate of magnesia, rubbed up with water, the mixture being then well washed with fresh portions of water until the water-washings are no longer milky from the presence of magnesium carbonate. It is again melted, filtered while hot through flannel, and, when cold, water is incorporated, and the lanolin becomes white, hard, and smooth.—*West. Druggist* and *Chem. News.*

New Tests for Lanolin.

PROFESSOR LIEBREICH has continued his experiments with the new ointment base, and has formulated the following more accurate tests for its purity and freedom from adulteration:

1. The most important test is its neutral reaction; if you apply to it blue litmus paper, it must not give any red color.

2. A more accurate test is to dissolve a small quantity of lanolin in benzin which is free from acid, and add a drop of phenol-phthalein. If now you add a normal solution of potassa, the first drop gives a red color.

3. If you heat for a short time a quantity of lanolin with distilled water, you will have two layers; the upper is a clear, yellow oily fluid, but not brown; the lower is a clear watery solution, which does not give any red reaction when applied to litmus.

4. If lanolin be freed from its water by heating it, the fatty matter must be completely soluble in ether, leaving no residue.

5. Lanolin when burned on a platinum spatula should leave no residue.

Terebene.

PURE terebene still continues to be reported upon more or less favorably, and we notice that the Collective Investigation Committee of the British Medical Association have received a large number of reports from all parts of the country. These, when tabulated and reported upon at the Brighton meeting, will, it is hoped, determine the place of the remedy in therapeutics.

Dr. J. Hutchison (Shawlands, N. B.) speaks very highly of it (*British Medical Journal*, July 3d), he having had but few failures with it in fifty-one cases of winter cough and bronchitis. We notice that he administered it in a way which has not previously been mentioned, viz., in cod-liver oil; but he did not find this method in any way superior to giving it on loaf-sugar. Still, if cod-liver oil is a part of a patient's physic as well as terebene, there is no reason why they should not be combined.—*Chem. and Drugg.*

Cacur, a Kaffir Emetic.

ONE of the most frequently employed of the many emetics used by the Kaffirs of South Africa is a green or yellowish-green fruit known as *Cacur*, *Cacuo*, or *small bitter apple.*

The author received a smally supply of this, together with leaves and stalks, from Mr. J. A. B. Bayley. The fruit is a pepo, is caducous, quite yellow when ripe, but is used by the natives in the unripe condition.

They heat the fruit, squirt the contents into the mouth, and emesis is produced about fifteen minutes after swallowing.

The author believed that the fruit was derived from a plant of the order *Cucurbitaceæ*, and this opinion was confirmed by Professor Oliver, of Kew, who believes it to be derived from *Cucumis myriocarpus* (Naudin), a green annual, referred to in Flora Capensis," 11, 495 (Harvey and Sonder).

Mr. Bayley states that it grows throughout Cape Colony and the Free State generally.

The plant produces fruit very abundantly; the pepo is sub-globose, about the size of a large gooseberry (weighing from 60 to 100 grains), and is beset with short and soft prickles. A section shows three parietal placentæ, numerous seeds imbedded in a soft viscid pulp, which becomes more fluid when warmed. The pulp is bitter, and has a faint odor of cucumber. The rind is soft, but peels off with difficulty; the seeds are exalbuminous, and the testa, like the rind, is slightly bitter.

To determine its therapeutic action, the author experimented with the pulp upon himself and upon a large dog, and concludes that it is an emetic and cholagogue purgative; purgative in non-emetic doses, and in doses sufficient to produce emesis causing purgation if sufficient of the drug has been retained. Its emetic action is probably local. The quantity of the drug at his command was too small to permit the author to make an exhaustive chemical analysis of it, but he has ascertained that it does not contain an alkaloid, but a bitter principle upon which its activity depends. He hopes to complete this part of the investigation at some future time.—G. ARMSTRONG ATKINSON, M.B., in *Ed. Med. J.* and *Chem. and Drug.*

Saccharinates of Quinine, Strychnine, and other Bitter Alkaloids.

THE sweet principle derived from coal-tar, discovered by Dr. C. Fahlberg, and called by him *saccharin* (for which name Hager proposes that of *saccharinin*, in order to avoid confusion; see our July number, p. 138), being in reality an acid, it was natural that the idea should suggest itself to combine it directly with bitter alkaloids or other bases to form palatable salts. Since it has been shown that there is apparently no objectional feature connected with the internal use of *saccharinin* [as we shall call it until some better name is proposed], there will probably be some demand for the compounds of this substance with quinine, strychnine, and other bitter alkaloids.

Saccharinin is, chemically, "anhydro-ortho-sulphamine-benzoic acid," or, leaving off the first two prefixes, it is a sulphamine-benzoic acid. A salt of quinine, therefore, containing this acid will be the "sulphamin-benzoate of quinine." But to remind the prescriber of its relation to saccharinin, it is likely to receive the name *saccharinate of quinine.* It would be improper to use the term *saccharate of quinine*, for this would be a salt containing saccharic acid, derived from ordinary sugars by oxidation.

Dr. Fahlberg has already obtained a patent upon these compounds. His process consists in neutralizing an aqueous or alcoholic solution of saccharinin (or sulphamin-benzoic acid) with the respective alkaloid. In order to obtain chemically neutral salts, he adds, in certain cases, an additional quantity of saccharinin.

The resulting salts are said to have in a great measure lost the disagreeable taste of the alkaloids. Others again report that it requires the addition of nearly an equal part of saccharinin to fully cover the taste.

We have had several inquiries from correspondents, where the saccharin (or saccharinin) can be obtained. We would state for their information that the patentees are at present erecting works to produce it on a large scale. As soon as it is ready for the market, it will be duly announced.

Note on Cocaine.

WE note in several of our exchanges that Mr. Bignon, Professor of Chemistry at Lima, Peru, has patented a process which, according to his claim, yields the alkaloid at once free from secondary products. In what other countries (outside of Peru) the patent has been granted we are not informed, but we have no hesitation in saying that the patent is not worth the paper it is written on, inasmuch as it is merely a special application of a general process long and well known as one of the methods for extracting alkaloids.

The patented process is described as follows (in *Neueste Erfind. und Erfahr.*, 1886, 325):

The coca leaves are macerated during 48 hours in a 20-per-cent solution of carbonate of sodium, then dried, and afterwards extracted, during about 48 hours, with petroleum ether in a suitable apparatus. The cocaine which has been set free by the alkali is dissolved by the petroleum ether. If this solution is now shaken with water containing hydrochloric acid, cocaine enters into solution as hydrochlorate, while the coloring matters and [most] other impurities remain in the petroleum ether. By treatment with an alkali carbonate, the free base may then be separated.

The same chemist states that not only strong acids (as has been known for a long time), but even weak acids gradually decompose the alkaloid. Even solutions of the purest salts of

cocaine are changed in a comparatively short time by a sort of fermentation. He also states that, while free cocaine remains unaltered at the ordinary temperature and in a dry atmosphere, alcoholic solutions of the alkaloid, or aqueous solutions of its salts, do not keep long, and that their anæsthetic effect diminishes from day to day. He therefore recommends to prepare the solutions of the different salts of cocaine *ex tempore*, by dissolving the pure alkaloid in water with the aid of the requisite quantity of the respective acid.

Can Apomorphine be Spontaneously Produced in Solutions of Morphine?

DR. HERMANN HAGER reported about a year ago that he had found apomorphine in a solution of a salt of morphine which had stood for some time. Recently a paragraph published in the *British Medical Journal* (June 26th; quoted in *Pharm. Journ.*, July 17th) brought the information that a 3-per-cent solution of hydrochlorate of morphine, which had been kept eleven months, gave rise, upon injection, to violent and uncontrollable vomiting. On being submitted to a Paris analyst, the latter reported having found apomorphine in it, the inference being drawn that the morphine had undergone some change. This has called forth a letter from Messrs. Macfarlan & Co., the well-known manufacturers of morphine, stating that all their experience goes to show that morphine hydrochlorate, whether in the solid form or in solution, may be kept under ordinary conditions for several years without losing its value, and that they have never found apomorphine in old solutions of the salt even after heating them with excess of acid at a temperature of 200° F. for several days.

We may add that the statement of Macfarlan & Co. is more in accordance with what may be expected than the reported change of morphine into apomorphine. The latter body is produced from morphine or codeine by heating it with concentrated (about 25 per cent) hydrochloric acid at 140° C., that is, in sealed tubes, or by heating morphine with dilute sulphuric acid to 140° C., or by heating hydrochlorate of morphine a short time, with a concentrated solution of chloride of zinc, between 120° and 160° C. In view of the considerable resistance which the molecule of water—eventually withdrawn from the morphine molecule—offers to acids and to heat, it is questionable whether such a withdrawal and splitting up could occur by the mere contact of the morphine salt with water at ordinary temperatures.

Salicylate of Iron.

THE use of a mixture containing salicylate of iron is recommended by Dr. Braithwaite, of Leeds, in cases of diarrhœa in children where the motions are fetid. The formula for a child two years of age is:

Sulphate of Iron	20 grains.
Salicylate of sodium	20 "
Glycerin	3 fl. dr.
Water	enough to make 3 fl. oz.

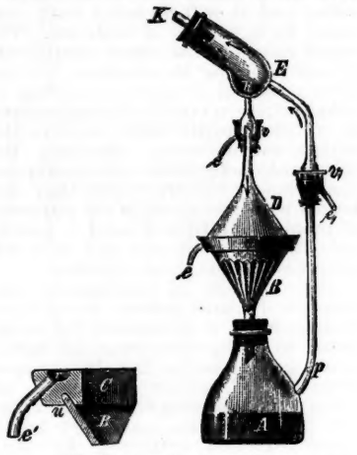
Dissolve the sulphate of iron and salicylate of sodium, each, in one-half of the water, and mix the solutions; then add the glycerin.

The color of the mixture is darker than port wine, and the taste is said not to be unpleasant.

One teaspoonful is to be given every hour until the motions become well blackened, and then at larger intervals, with an occasional dose of castor oil, to counteract the constipating effect.—After *Pharm. Journ.*

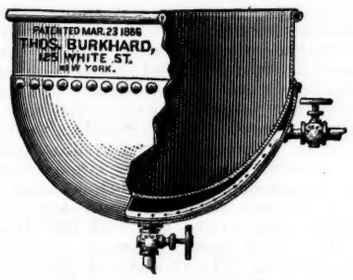
APPARATUS FOR CONTINUOUS EXTRACTION.

AN apparatus for continuous extraction, which may be taken apart or put together at a moment's notice, has been designed by Th. Weyl. Its construction is evident from the accompanying cut. At *v*, *v*, and *C* there are mercury joints. The portion marked *E*, with its two descending tubes, is one piece. So is also the flask *A*, with its tube *p*. The two mercury joints at *v* and *v* are made by attaching glass cups to the respective ends of the tubes, by means of cork or rubber rings. The mercury joint at the edge



Weyl's extraction apparatus.

of the funnel *C* is made, as shown in the smaller cut, by cementing to the edge of the funnel a wooden ring *C*, in the upper portion of which there is a a groove filled mercury, in which the funnel *D* is placed. *K* leads to the condenser. The gutters *e*, *e*, and *e'* serve for emptying the mercury joints, but are, of course, closed with stoppers, when the cups are filled with mercury.—*Zeitsch. f. Instrum.*, 5, 126, and *Z. f. Anal. Chem.*, 1886, 396.



Burkhard's improved steam-kettle.

Cream Punch for Delicate Stomachs.

TAKE one cup of good cream; beat well, add sugar and one-half or a whole teaspoonful of brandy. To be taken through a straw as lemonade. If the patient is a dyspeptic and eats lightly of good food at meal time, the cream punch may be taken three hours after meals, as then intestinal digestion is best aided.

Corrosive Sublimate and Sugar as an Antiseptic Dressing.

A MIXTURE of corrosive sublimate with sugar in the proportion of 1 in 1,000, has been strongly recommended by Dr. Heidenreich as a first dressing for wounds on a field of battle (*Lancet*, June 12th, p. 1,135). It is claimed that sugar is the best substance for diluting the sublimate, being itself somewhat antiseptic, and is suitable for use wherever water is available. Of course, it is important that the mercurial salt should be equally distributed through the mass, which is easily effected by dissolving it in a little spirit and carefully rubbing up the sugar with it.—*Pharm. Journ.*

AN IMPROVED JACKET STEAM KETTLE.

HERETOFORE it has been customary to admit steam into jacketed steam kettles by a simple inlet, the jet of hot steam playing directly against the nearest opposite wall of the inner kettle, whereby this particular spot generally became highly overheated. Therefore, when the kettle contained liquids of high boiling point, it was not unusual that some of the contents would be baked against this particular spot, and otherwise injuriously affected. Mr. Thos. Burkhard, of New York, has now introduced an improvement by which the steam is uniformly distributed over the whole heating surface, with its original force and temperature, thereby insuring a perfectly uniform heating of the contents of the kettle, as well as a considerable saving in steam. This is accomplished by placing a coil of copper tubing within the jacket, which, being perforated, allows the steam to issue with its original temperature. The inventor also claims that the pressure is thereby regulated, and all risk of bursting avoided; and, in addition, that there is produced a reservation of heat and a superheating of the pipe itself.

These kettles are made of seamless copper, and tested to 125 lbs. pressure. They may be made either stationary or so as to be tilted over.

Impurities in Ether.

HAGER and others have held that any rectified ether which has a low specific gravity (say, between 0.735 and 0.725 or lower) cannot be contaminated with any of the heavier substances which are liable to be produced during the course of distillation. Accordingly, it would be unnecessary to examine such grades of ether for heavy oil of wine, or other substances which are left behind to a large extent, when some of the ether is allowed to evaporate spontaneously.

This assumption [which is not shared by experts in this country, so far as we are aware], has been shown to be fallacious by G. Vulpius, who found as much as 1% of heavy oil of wine or allied compounds in an ether having a spec. grav. of only 0.722. — After *Pharm. Centralh.*

Crystallized Quinidine.

ACCORDING to Dr. Hesse (*Berichte* 10, 2,154), quinidine (conchinine) crystallizes from alcoholic solution with 2½ molecules of water of crystallization, of which ½ mol. is given off at the ordinary temperature, and the other 2 mol. are driven off at 120° C.

According to Dr. Mylius (*Berichte* 19, 1,773), a hot solution of quinidine in absolute alcohol deposits on cooling well-formed prisms which contain no water of crystallization, but a molecule of alcohol in combination ($C_{20}H_{24}N_2O_2 . C_2H_6O$).

These two statements, however, though apparently contradictory, are not so necessarily, for it seems fairly obvious that it was not absolute alcohol that Hesse referred to as yielding a crystallization containing 2½ mol. of water, and at the most the official alcohol (Pharm. Germ.) of spec. gr. 0.830 to 0.834.

But, in addition, Dr. Mylius states that in his experience the alkaloid is deposited from a hot aqueous solution anhydrous. Besides the compound with ethylic alcohol, Dr. Mylius states that he has obtained similar combinations with methylic, propylic, and allylic alcohols, as well as with the bivalent ethylene alcohol, in the last instance the combination being 1 mol. of the alcohol with 2 mol. of the alkaloid.—*Pharm. Journ.*

The Medicinal Nitrites, Including Nitroglycerin.*

NITRITE of sodium must be regarded as the *inorganic* nitrite to be recommended in medicine, although it is open to the objection that decomposition will occur in the stomach if that organ contains much acid, a decomposition evidenced by the eructations of nitrous compounds occurring occasionally after the administration of this salt, and by the vomiting, and even diarrhœa produced by large doses. Nitrite of sodium is now generally sold in a fairly pure state, and the purer specimens are those of the crystallized salt, the sticks usually containing a considerable trace of iron, although this, too, is not an infrequent impurity to a slight extent in the crystals. Potassium nitrite, too, usually contains some. Probably the solutions are evaporated in iron vessels. The solubility of nitrite of sodium I find to be 1 in 1.14 of distilled water, 1 in 30 of rectified spirit, and 1 in 160 of ethylic alcohol, all at 60° F. The method of estimating the amount of nitrite present with which I have obtained the most accurate results is the permanganate process. Fairly accurate results can well enough be obtained by Eykman's or Allen's process for the estimation of ethyl nitrite, as Mr. Allen pointed out in regard to his own process in the *Journal of Chemical Industry* for March 30th, 1885. . . .

Nitrites are stated, in solution or not, gradually to become converted into nitrates by the absorption of oxygen. It is, therefore, important to consider the stability of nitrite of sodium either in its solid state or in watery solution. The salt is described as deliquescent; in an ordinarily dry room it is so only to a slight extent; if exposed uncorked it does absorb water somewhat, but if kept in a well-corked bottle, however frequently opened, no change practically occurs. I have kept thoroughly dried powdered nitrite of sodium thus, and after four or five months it had gained barely 1 per cent by weight, and after being redried, it contained almost absolutely the same amount of nitrous acid as before exposure. I have kept the similarly dried powdered salt on the water bath for eighteen to twenty hours with the loss of an infinitesimal proportion of varying strength in nitrite, the small quantity lost being probably converted into nitrate. I have also boiled solutions for several hours, and have, by appropriate arrangement, bubbled air through solutions of the salt for days with like results. Thus, then, we see nitrite of sodium in solution, in the absence of stronger acids than nitrous, and of ferments, is a perfectly stable salt. Its watery solution is, however, somewhat apt to be the seat of the growth of a form of mould if exposed to the air, and such a growth naturally causes considerable deterioration in the strength of the solution.

We now pass to the organic nitrites, and with them I wish to consider *nitroglycerin*. Of the organic nitrites the *nitrites* of *methyl*, *ethyl*, and *amyl* alone need detain us. *Nitrite of methyl* (CH_3NO_2), although it has been administered, is unsuitable, as boiling below 32° F.; it is always sold in alcoholic solutions, and even this deteriorates very rapidly. *Ethyl nitrite* is specially considered in relation to spirit of nitrous ether, and so much has in recent years appeared in this journal concerning this substance and its estimation that I can comparatively briefly dismiss it. It is very generally agreed that the pharmacopœial solution is not stable, especially when prescribed with water; its decomposition in this connection has been pointed out by Mr. Allen (*Pharm. Journ.*, Nov. 21st, 1885, AM. DRUGG., 1885, 216), and I can quite confirm his results. It is very commonly prescribed with solution of acetate or citrate of ammonium. With these preparations naturally a certain amount of double decomposition will occur, but as to the nitrous element, deterioration, though still rapid, is not quite so rapid as when water alone is employed. This spirit of nitrous ether while not then to be considered reliable as to its most important constituent, and therefore not suited for the more valuable uses to which nitrites are put, yet contains other constituents which make it useful as a mild diuretic and diaphoretic, and it will probably long continue to be so used in medicine. The exact value of these other constituents I hope ere long to ascertain. It has been proposed to make a solution of ethyl nitrite in ethylic alcohol or even in rectified spirit; these preserve the nitrite much better, especially the ethylic alcohol solution, but decomposition rapidly occurs when they are mixed with water, while for purposes of inhalation nitrite of amyl is preferable, as here both acid and base act somewhat in the same direction.

The method of estimating the amount of nitrite present in spirit of nitrous ether is now generally recognized to be by measuring the nitric oxide gas given by the decomposed acid radical, either Eykman's or Allen's process being employed. These two processes have been very fairly compared and criticised by Dott (*Pharm. Journ.*, Feb. 28th, 1885), and I have made many comparative experiments with the two methods, following Eykman's directions as given in this journal (July 23d, 1882) [first published in NEW REMEDIES, 1882, p. 139], and Allen's as published in the number for November 21st, 1885. I used both aqueous and alcoholic solutions of standardized nitrite of sodium and found either method gave almost accurate results. Allen's, of course, is much more easily worked, and, as he mentions, while his formula is roughly correct, you get more satisfactory results by correcting for temperature, pressure, and aqueous tension. I certainly object to his statement that a pipette is unnecessary to measure the solution to be tested, and I always employ one. Further, agitation by a purely transverse movement is generally insufficient; I use transverse agitation first, and then, after a few minutes, with one hand close the India-rubber tube, and with the other give a not very vigorous vertical movement. The closure of the connecting tube prevents agitation of the lower strata of fluid; the vertical agitation causes decomposition of any volatilized nitrite. I do not find cooling the tube in water, and correcting for the temperature of the water, gives more accurate results than merely allowing it to stand in the clamp until two readings are the same, and correcting at the temperature of the air. A source of fallacy to be avoided is the admission of air mixed with or dissolved by the solutions, but with care this need not occur. By waiting until all air bubbles have floated out I get quite as good results as by cooling boiling solutions of the substances to be used in an atmosphere of coal gas and filling the tubes in a similar atmosphere by a properly constructed apparatus. Almost identical amounts of nitric oxide gas were obtained by either Allen's or Eykman's method from various average samples of spirit of nitrous ether; if the samples were very defective in nitrite, Eykman's process gave distinctly lower, and, I think, more accurate results than Allen's. Here one was using from 10 to 20 C.c. of the spirit, and the high tension of the other constituents was probably the cause of the difference. To sum up, Eykman's process, as one might conjecture, is more accurate than Allen's, but more open to experimental errors, and much more difficult to employ. Allen's is the method which meets our ordinary wants most conveniently.

Nitrite of amyl has still to be discussed. It is much more stable than the corresponding salt of ethyl, and if preserved in well-stoppered bottles, protected from the light, it takes some years to become even approximately inert. Good specimens, when fresh, have usually from seventy-five to eighty per cent of actual nitrite, and even after more than a year, with bottles occasionally opened and not very carefully preserved, I generally find about fifty per cent. The chief products of decomposition are amyl alcohol, amyl valerianate, and valerianic acid. The strength as to the nitrite is rapidly tested in the same way as spirit of nitrous ether, the decomposition of the compound is not quite so rapid, however. Various menstrua and combinations of menstrua have been recommended for the internal administration of amyl nitrite, but I cannot regard any of them as commendable. Nitrite of amyl should be employed for inhalation alone.

Finally, we pass to *nitroglycerin*, the trinitrate of glyceryl, propenyl trinitrate, or glonoin. There are several other nitrites somewhat allied to nitroglycerin, which probably behave in a similar manner, as nitrosaccharose, nitroamylum, and nitrocellulose—the last certainly (Hay, *Practitioner*, May, 1883). None, however, is so suitable as nitroglycerin.

This compound ether, as I already have mentioned, is regarded, by Hay especially, as owing its activity to its decomposition in the blood with the production of a nitrite—a matter still, I think, *sub judice*.

The drug, however, is practically unacted on by the gastric juice—a point of great importance, where we wish absorption without decomposition. Nitroglycerin is a sweet, colorless body, with a slightly pungent taste; its solubility in menstrua other than water is correctly enough stated; as a rule, in water many authorities note it as almost or quite insoluble, Hay (in various papers) as one in eight hundred. I find it to be one in seven hundred and sixty, but it requires four or five days to dissolve to this extent, and the bottles require frequent agitation. When prescribed with water, the water must always be distilled, or decomposition will occur, the rapidity of decomposition varying directly as the amount of salts in the various waters. Its watery solution (in distilled water) is quite stable, provided the nitroglycerin be pure. Solutions in alcohol keep equally well.

The tablets of the pharmacopœia are generally fairly uniform as to their strength—no one would expect them to be mathematically exact—and are quite stable.

I should suggest that a one per one-thousand aqueous solution of nitroglycerin be employed in therapeutics, the average dose being five to thirty minims. Some clinicians have stated that the alcoholic or watery solution acts more rapidly than the tablets do, and I agree with them; the difference, however, is very slight, but the tablets hold their position from their convenience alone. The name nitroglycerin being alarming to some persons, trinitrin has been used instead; propenyl trinitrate may also be introduced into medical parlance, but I should give preference over all to trinitrate of glyceryl (glyceryl trinitras), which expresses its composition and is an accurate name. Nitroglycerin leads one to suppose we are dealing with a nitro-substitution body. I may mention I estimated the strength of the nitroglycerin solutions by decomposing the ether with caustic potash, and

* Extracts from a paper on the "Pharmacognosy of the Nitrites," by G. Armstrong Atkinson, M.B., in the Pharm. Journ., July 3d.

calculating the amount of nitrite formed by comparison with a standardized solution of nitrite of sodium, as recommended by Hay, using both the starch iodide reaction and William's modification of Griess' metaphenylenediamine test. To this latter the production of the resinous body I have referred to is a slight objection, but practically it does not interfere with the delicacy of the reaction, the amount of dilution being so great. Further, I dissolved weighed quantities of nitroglycerin in water, so as to prove that seven hundred and sixty parts of distilled water would dissolve one part of nitroglycerin.

The Purification of Cotton-Seed Oil.

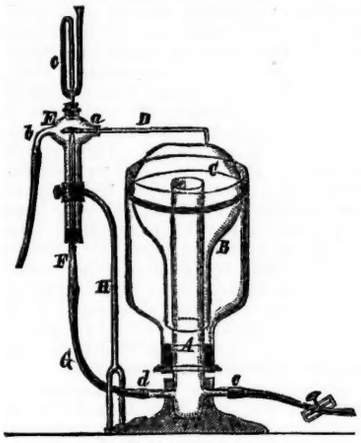
THE quantity of cotton seed annually crushed and pressed for oil in the United States probably equals two and three-quarter millions of tons, and if we add to this the half million tons similarly treated in Europe, the proportions of this giant infant industry begin to appear. As expressed, the oil is of an intense ruby color, sometimes verging to black, owing to its containing in solution a powerful vegetable coloring principle, properly termed *gossypin*. This peculiarity distinguishes it from all other oils. The oil cells appear in the seeds as brown specks dispersed through the albuminous matter. According to Mr. James Longmore, of the Liverpool section of the Society of Chemical Industry, who has given great attention to the subject, the quantity of coloring matter in a ton of crude oil is fifteen pounds, although this proportion must vary considerably. The woody husk of the seed also contains a large quantity, apparently of the same nature.

Its properties are insolubility in acids, slight solubility in water, free solubility in alcohol or alkalies. In its dry state it is a light powder of a pungent odor, of a brown color, and strongly tinctorial.

For expression, the seeds are first crushed by passing through rollers, and then ground to a fine state of division under edge wheels. When sufficiently reduced, the powder is transferred to steam jacketed kettles and heated for about ten minutes to a temperature sufficient to render the oil more easily expressible, and to coagulate the albumin of the seed. From the kettles the hot and finely-ground seed is put in coarse bags, each making a cake weighing about ten pounds, and subjected to powerful hydraulic pressure. The crude, nearly black oil, containing the coloring matter in solution, is by this means expressed, and runs into a tank from which it is transferred to the refinery. The next step is the removal of the coloring matter, the process bringing the oil to a light straw or yellow tint.

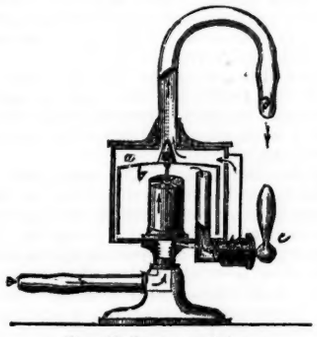
The tank used is of iron; it is provided with a mechanical agitator, and its capacity sufficiently exceeds that of the charge of 10 tons weight of crude oil, and 30 cwt. caustic soda lye of 10° to 12° Twaddell. The lye at the temperature of 60° F. is fed slowly by perforated pipes extending over the surface of the oil and distributing uniformly. As the agitation proceeds, the lye and oil, which are both cool, mix, and latter gradually becomes full of black, flocculent particles of soap, caused by the partial saponification of a portion of the oil by the caustic soda lye. The agitation is continued for about half an hour, and at the end of that time a portion is taken out and allowed to stand. If the soapy particles precipitate, and the oil is found nearly deprived of color, the operation is then terminated. If not, the agitation is continued, more lye being added until the desired discoloration is obtained. The charge of oil is then allowed to stand for twelve or fifteen hours, until the "mucilage" or partially saponified portion of the oil, with the liquid excess of lye used, has settled away. The clear oil is then run off, and the refining completed by washing and bleaching.

The success of this process evidently depends on the property the coloring matter possesses of solubility in alkalies. The particles of soap seem to be sufficiently alkaline at the moment of forming to inclose within them the coloring matter, which is thus precipitated from the rest of the oil. After separation, the precipitate is treated with strong soda lye, say 70° Twaddell, and heated. The coloring matter



Schiff's thermoregulator.

is thus dissolved out, the solution filtered from the saponaceous mass, and dilute sulphuric acid gradually added to the filtrate until the alkali is completely neutralized. The gossypin then separates as a flocculent precipitate. This is collected on a filter, carefully washed, to remove any trace of acid, and dried slowly at a low temperature. It is then ready for use as



Giroud's thermoregulator.

a dye, and gives fast colors on both wool and silk. The saponaceous mass, partially discolorized by the caustic soda lye, may either be converted into hard soap, or, by addition of milk of lime, be deprived of any albuminous matter, be bleached with chlorated lime (chloride of lime), and, by treatment with a mineral acid, the refined oil mingled with fatty acids obtained.

Sodium Cheapened.—According to a statement in the *Scientific American* (June 5th, p. 362), Mr. H. G. Castner, a chemist, resident in New York, has discovered a new method of distilling sodium, by which that metal will be produceable for about one shilling per pound. As sodium is an important material in the manufacture of aluminum, this discovery, should it be confirmed, would have an important influence upon the future of that metal, since its cost would be considerably reduced. A supply of sodium at a low price might also bring magnesium, silicon, and boron within the reach of practical application. [In the case of magnesium, this has already been accomplished by preparing it electrolytically.]

THERMOREGULATORS.

THE number of thermoregulators, or apparatuses for maintaining uniform temperatures, is already quite considerable, but perfection is far from being reached. We have already described various forms, and in the following we give an account of several others:

1. *Schiff's Thermoregulator* (*Ber. d. Deutsch. Chem. Ges.*, 18, 2,833; *Zeitsch. f. Anal. Chem.*, 1886, 385). This is entirely composed of glass, and may be easily put together.

The gas enters through the tube *e*, and reaches the burner through *b*. *A* is a wide-mouth bottle without bottom, fastened by means of a cork over the glass tube *A*. The bottle *B* is filled with water (to which a little hydrochloric and carbolic acids are added), and a flask *B* is inverted over the tube. This flask, floating in the liquid, is, of course, very sensitive to any increased pressure or rush of gas coming from the main supply. After the gas has passed through *e*, *A*, *d*, and *F*, it issues at the orifice of the tube *F* inside of the globe *E*. A glass rod *D* passes through a thin rubber-disk in the tubulure *a*, the outer end of the tube being bent downward, and the inner end flattened and provided with a rubber disk, which, when pressed against the orifice of the tube *F*, shuts off the gas. The whole arrangement, *E*, *F*, may be adjusted higher or lower by the rod and clamp *H*. Whenever the gas enters with more than ordinary pressure, the flask *B* is raised, pushes up the outer end of *D*, and the inner end of this closes the orifice of the gas delivery tube.

A separate small tube, not shown in the cut, leads to the burner, where a small flame is kept up even when the regulator has shut off the supply.

2. *Giroud's Thermoregulator* (*Berichte, l. c.*). The gas passes in the in the direction of the arrows. After issuing from the central conus, it enters the space *b*, which is covered by an inverted cup floating in some kind of liquid (such as glycerin). The upper wall of this cup has a small orifice *a*, through which a small amount of the gas may reach the burner at all times. When the faucet *c* is turned in the manner shown in the cut, the current of gas passes unobstructed, as indicated by the arrows, and reaches the burner by means of tubing to be attached to *d*. When the pressure becomes too great, the cup *b* is raised and with it the conical attachment *e*, whereby the passage of the gas is interrupted. When it is desired to make the apparatus more sensitive to any variations of pressure, the small orifice at *a* is closed with a drop of stearic acid.

Vanillin in Asafœtida.

MR. E. SCHMIDT, while engaged in the preparation of ferulic acid from asafœtida, observed in the last mother-liquor of the acid a pronounced odor of vanillin. This observation has been followed up by Leineke and Denner, who have succeeded in isolating vanillin from the drug. The *modus operandi* employed is as follows: The resin is powdered and repeatedly treated with ether, the filtered solutions shaken up with a concentrated solution of sodium bisulphite, the alkaline solution acidified with sulphuric acid and again extracted with ether.

The crude vanillin obtained after distillation of the ether is again treated with sodium bisulphite, sulphuric acid, and ether, and the ethereal residue is mixed with a little water, filtered, and crystallized over sulphuric acid. The vanillin appears in well-shaped, easily volatilized crystals, melting at 81° to 82°, and possessing all chemical and physical properties of ordinary vanillin.—*Chem. and Drugg.*

The Manufacture of Ceresin from Ozokerite.*

In the showcase of a Belgian manufacturer of candles, at the Antwerp Exhibition, was to be seen a fragment of wax-like substance labelled "Ozokerite, or Vegetable Wax." This fact shows how little is known, even by those most nearly interested, of an industry which, dating back only about fifteen years, has attained an annual value of upwards of half a million pounds sterling. The ignorance is no doubt due, mainly, to the paucity of information that has been published respecting the industry and the raw material used in it.

The first attempt at bleaching mineral wax known to the author dates from 1870. The first industrial results were obtained by H. Sljhely, of Stockerau, near Vienna, Dr. Pilz, of Carlsbad, and J. F. Otto, of Frankfort-upon-Oder; ceresin was introduced into the market by these different houses in the course of 1872.

During the last ten years a number of processes for the purification of ozokerite have been proposed, very few of which have been practically successful. At the present time scarcely more than two processes are employed, both of which are based upon the employment of sulphuric acid. In the more important establishments where mineral wax is refined, the ozokerite is heated in contact with sulphuric acid to a temperature of 180° C. and even higher, by which means an almost complete decomposition of the sulphuric acid and carbonization of the substances separated by it is effected. In some smaller factories where the operations are conducted at a much lower temperature, the acid, charged with the impurities, collects at the bottom of the vessel as a black tarry mass that is easily separated.

In whatever way the operation is conducted, it is necessary first to free the crude ozokerite, as delivered from the melters of Borislaw in eastern Galicia, from the small quantity of water that it always contains; for which purpose it is dried by heating it to 120° C., at which temperature the water is entirely driven off. The mineral wax requires to be heated very slowly to avoid sudden ebullition of the melted mass, through the superheating of the water, and small pieces of the crude wax are thrown into it whenever it threatens to rise. In some cases this heating is effected in the same boilers as the heating with sulphuric acid; in others a special vessel is used which allows of the deposit of mechanically mixed impurities at the bottom. The vessels for the preliminary boiling, which should be of a capacity sufficient for a day's product, are heated either over a bare fire, or are jacketed and heated by steam. In the former case the apparatus takes the form of an alembic, consisting of a hemispherical boiler with dome and cooling worm, in which any vapor of the light oil given off during the melting is condensed. When the heating is effected by steam, the small quantities of hydrocarbon carried away with the steam do not necessitate any arrangements for condensation.

In carrying out the first-mentioned method of bleaching, where the temperature is raised to 180° C., the mixture of the ozokerite with the sulphuric acid is effected either by means of an iron or copper stirrer worked by hand, or by a mechanical agitator. Although the latter arrangement would appear in principle to be much the more rational of the two, it is not the most used, even in the larger manufacturies, in consequence of practical difficulties that have not yet been satisfactorily overcome. After the earth-wax has been freed from water it is placed in the acidifying vessel with a mixture of vitriol and fuming sulphuric acid in proportions corresponding to the quantity required; it is then gradually heated with constant stirring to 180° C., at which temperature the sulphuric acid is almost completely driven off. After neutralization of the last traces of acid and partial decolorization, the mixture is allowed to stand. The tolerably clear layer of ceresin that forms at the top is drawn off and filtered through paper; the residue is pressed, whilst still in a warm pasty condition, in hydraulic presses, the runnings being also filtered through paper. As a result of these operations only about two-thirds of the ceresin present in the ozokerite is obtained, the other third being retained in the press residue. This is now generally recovered by extraction, petroleum benzin being the solvent used in most factories, and only here and there carbon bisulphide. The ceresin extracted is freed from traces of the solvent by passing superheated steam through it and then filtered. The entire yield by this method of operating amounts to 70 to 75 parts of white, or 80 to 85 parts yellow ceresin from 100 parts of ozokerite used.

According to the second method of working, the dehydrated ozokerite is introduced into the mixing vessel in the melted condition at the lowest possible temperature, and then mixed by means of a mechanical stirrer or a current of dry air with exactly the quantity of sulphuric acid required to effect the reaction. After standing, the top layer of dark-colored but clear ceresin is drawn off into another vessel, where it is neutralized and decolorized and then filtered. The black tarry residue is neutralized and submitted to distillation, the distillate consisting of paraffin and mineral oils. This method has many disadvantages and is not largely followed. Both methods are, indeed, defective, since it is known that crude ozokerite can be made to yield 90 to 92 per cent of a white bleached product instead of the 70 to 75 per cent usually obtained in manufactories.

The filtered ceresin, if intended for yellow goods, is brought up to the right tint by means of gamboge, turmeric, dragon's blood, or one of the various aniline colors soluble in fats, and then poured into moulds to cool. The "half white" and "white" ceresin is stirred continually while cooling to prevent crystallization, and it is not until it has solidified to a pasty consistence that it is poured into the moulds. In this way a whiter appearance in reflected light is produced.

White ceresin is frequently mixed by the manufacturers with the lower priced paraffin and the yellow ceresin with resin. The addition of paraffin cannot be detected either by chemical tests or determination of the specific gravity. It is, however, hardly to be deemed an adulteration since in some cases, as for illuminating purposes, its presence is advantageous. The addition of resin ought, however, to be deemed an adulteratian. For its determination the suspected ceresin should be dissolved in hot alcohol, and the mixture then cooled and filtered. The ceresin being almost insoluble in cold alcohol is removed, and any resin present will be found in the residue upon evaporation of the filtrate.

* Abstract in Pharm. Journ., July 31st, of a paper by E. Sauerlandt in the Chemiker Zeitung, 1886, pp. 21 and 38.

Colocynthin related to Elaterin.

According to E. Johannson (*Journ. de Pharmacologie*, p. 258), when colocynthin is heated with dilute sulphuric acid, it is split up into colocynthein, *elaterin*, and bryonin.—*Pharm. Journ.*

Aluminum in Germany.

[REPORT OF CONSUL-GENERAL RAINE, OF BERLIN.]

I have the honor to report that in Hamelingen, near Bremen, a factory is in the course of erection which projects the production of aluminum (or aluminium) and magnesium on a large scale.

The statement, however, that this will be the first factory of its kind in the world must be considered as erroneous, since Messrs. E. H. & A. N. Cowles, of Cleveland, O. (Cowles' Electric Smelting and Aluminum Company), have for some time successfully produced aluminum and its alloys in large quantities and at reduced prices. It is well known that heretofore aluminum and magnesium were produced only in small quantities at high prices.

The consumption was comparatively limited. The new factory, like that of Cowles', projects production in large quantities under Graetzel's patent.

The process of the Frenchman, Deville, heretofore generally in use, consists in decomposing sodium-aluminum chloride in reverbatory furnaces by adding to it, in a suitable manner, a flux (formerly fluor-spar, now cryolite), whereby the sodium used for reductions is replaced by zinc.

By this process the price of aluminum has been not less than 75 to 80 marks (=$17.75 to $20), a metal too costly for many technical purposes.

Graetzel readopted the idea of Bunsen, to separate the aluminum by electricity. He applies a very powerful dynamo-electric current, which he conducts through molten sodium-aluminum-chloride, whereby the desired metal is deposited at the negative electrode (cathode), and chlorine at the positive electrode (anode).

This process has been patented nearly everywhere. The aluminum, by its slight specific gravity—it is only 2½ times heavier than water—has for a long time encouraged the hope that it could be produced in large quantities at a low price, and thus become more generally available for technical purposes.

Louis Napoleon spent large sums for experiments. Deville's process was the result. Napoleon thought that it could be used for the manufacture of military cuirasses and helmets.

The aluminum combines lightness with great durability, beauty, and plasticity. It can be drawn into fine wire (down to one-fifteenth millimeter in thickness) and beaten into thin lamels.

It is capable of taking a fine polish, and can be engraved, and, by galvanism, silvered and gilded. In the air it does not tarnish, and in water it remains unaltered. Though it is not a precious metal, it is, notwithstanding, not more subject to corrosion by acids and alkalies than iron. It is, however, not fire-proof; by combustion it is reduced to valueless alumina. Its fine, white, silver-brilliant, not-tarnishing color makes it very adaptable for ornaments of all kinds, opera-glasses, etc.

Besides the pure aluminum, its alloys are also useful for many technical purposes. A particularly beautiful bronze, brilliant like gold, is obtained from 90 to 95 per cent copper and 10 to 5 per cent aluminum.

Other compounds are stated to be eminently suitable for parts of machinery.

Magnesium is likewise separated by the electric current from a combination with chlorine.

New Austrian Pharmacopœia.

It is reported that the work of revising the Austrian Pharmacopœia, the last edition of which was issued in 1869, is to be initiated during September of the current year.

IMPROVEMENT IN KJELDAHL'S METHOD OF ESTIMATING NITROGEN.

THE estimation of nitrogen in organic and inorganic substances has become such an easy operation since the general introduction of Kjeldahl's method that it may be executed by any one having moderate analytical experience. We have described it in detail in previous issues, and, therefore, before describing the improvement we wish to draw attention to, will only briefly recapitulate it.

Not more than 1 Gm. of the nitrogenized substance (and if it contains over 10% of nitrogen, not more than 0.1 or 0.2 Gm.) is introduced into a flask of about 200 C.c. capacity, about 0.7 Gm. of oxide of mercury added (this takes no part in the reaction), and then 20 C.c. of pure concentrated sulphuric acid. If the substance is fatty, a small piece of paraffin will prevent excessive foaming. The flask is then loosely stoppered, best with a glass bulb having a long stem, placed in a slanting position on wire-gauze, and at first heated gently, but afterwards to boiling until the contents are colorless. The whole of the nitrogen has now been converted into ammonia, combined with sulphuric acid. The liquid is next rinsed into a distilling flask, 120 to 140 C.c. of a solution of soda (free from nitrate) containing about 25% of NaHO are added, and then 25 Gm. of a solution of sulphide of potassium (40 Gm. in 1 liter) to precipitate the mercury as sulphide.* The liquid is then distilled, and the distillate caught in standard sulphuric acid. From the amount of acid saturated by the ammonia, the quantity of nitrogen present in the original substance is calculated.

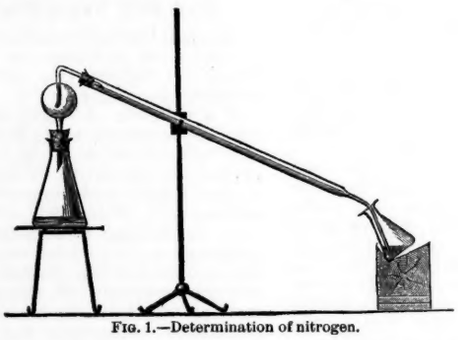


FIG. 1.—Determination of nitrogen.

As there is some risk of small quantities of the alkaline contents of the flask being mechanically carried over during the distillation, it is customary not to connect the condenser directly with the flask, but to interpose a globular or other kind of bulb-tube, such, for instance, as is shown in the annexed cut (Fig. 1).

It has, however, been ascertained that even this precaution is not sufficient to guard against the mechanical transportation of traces of the alkali with the vapors. According to Arth. Rindell and F. Hannin, this may be accomplished in a practically complete manner by making the vapors pass a tube filled with small glass pearls, inclosed within another tube, as shown in the cut (Fig. 2). This tube is closed below with a nickel sieve, has a diameter of 10 to 12 millimeters, and should contain a column of glass pearls at least 8 Cm. high.

The same authors also recommend to use a very dilute volumetric sulphuric acid, preferably one containing $\frac{1}{20}$ of a molecule in the liter, of which 1 C.c. corresponds to 0.0006862 Gm. of nitrogen.—*Zeit. f. An. Chem.*, 1886, 155.

* The addition of the oxide of mercury and its subsequent removal by sulphide of ammonium are improvements introduced by Reitmair and Stutzer.

A NEW AND IMPROVED FORM OF NITROMETER.

THE nitrometers heretofore designed and described appear to be, all of them, affected by certain defects and sources of error, nearly all of which may probably be eliminated by improvements in construction. A proposition in this direction has recently been made by W. Knop, who figures and describes his improved apparatus in the *Zeitsch. f. Anal. Chem.* (1886, 305.)

The designer's chief object was to eliminate the error caused by a variation in volume, in consequence of the expansion of the connecting tubing or the inequality of temperature existing in the several portions of the apparatus. He therefore constructed the latter in such a way that every portion of the apparatus is immersed in water during the reaction, while the rubber tubing used for connection is the very stoutest (but flexible) that it is practicable to use.

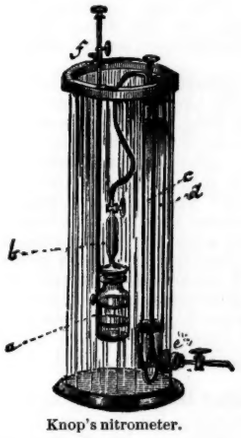
The different parts of the apparatus are: First, a generating vessel *a*, being a bottle into which is fitted an accurately ground, hollow glass stopper continued into an expanded tube *b* which terminates in a faucet. The tube *b* is filled with small glass pearls.

FIG. 2.

Second, a U-tube; consisting of the two burette-shaped tubes *c* and *d*, which are connected below by means of a short piece of heavy rubber tubing. One of these burettes—that which is not graduated—has a tubulure near its bottom, and this tubulure is connected with the glass faucet which passes through the tubulure of the large glass jar, into which the whole apparatus is placed. It may be stated here that the jar is to be filled with water after all parts of the apparatus are placed within it, in order to equalize the temperature. A brass-ring surrounds the upper edge of the jar, and to the ring are fastened two clamps, one of which holds the U-shaped measuring tubes firmly in position, while the other holds a rod which may be raised or lowered, and the lower end of which serves to hold the generating bottle.

When the apparatus is to be used, the jar is filled with water at or near 60° F., the rod holding the generating bottle is drawn up, and the bottle removed and placed on the table alongside of the jar. The rubber tubing connecting the bottle with the measuring tube must be long enough to permit this without stretching the tube. Next the stopper is removed from the bottle and, having been turned upside down and being held in this position (while the glass faucet is closed), some alkaline bromine solution is poured in. This will flow over the glass pearls and moisten them thoroughly, and any gas which will subsequently pass over them will be thoroughly washed and freed from carbonic acid thereby. The stopper is now inserted in the bottle, and left there until all excess of liquid has drained off and run into the bottle. A sufficient amount of the bromated lye is now poured into the bottle, and a measured or weighed quantity of the liquid to be examined, introduced into a short tube, is placed within the generator and the latter again stoppered.

Previous to this, the U-tubes may be filled with distilled water, which is facilitated by the fact that the ungraduated tube is longer than the other and therefore projects above the surface of the water in the glass jar. The bottle is then placed within the clamp at the foot of the rod and lowered down into the water, the glass faucet having, of course, previously been opened. Next it is necessary to adjust the water in the measuring tube so that it will stand exactly at 0 mark. This is done simply by allowing enough of the distilled water to escape by the faucet at *e* until this point is reached. The rubber tube leading to the measuring tube must be immersed in the water. Both this and the shorter piece of rubber tube connecting the burettes is to be of the very stoutest pure gum tubing with a very small bore. After the apparatus has stood a while, so as to acquire a uniform temperature, the generating bottle *a* is again drawn up, and, by inverting it, the liquid to be tested (contained in the introduced tube) made to mingle with the lye and thoroughly agitated. The bottle is then re-immersed, and as gas is given off and displaces the water in the measuring tube, a sufficient quantity of water is allowed to flow from the other tube through *e* to equalize the level in the other. When the generation of gas has ceased, the level in the two tubes is restored exactly, and after the temperature has been allowed again to become equalized, the volume of gas in the measuring tube read off.



Knop's nitrometer.

This apparatus is manufactured by Franz Hugershoff, of Leipzig, and may be obtained through dealers in chemical apparatus.

No matter what form of nitrometer may be used, or which nitrogenized substances may be analyzed, there are always some sources of error which can only be ascertained indirectly. One of these is the solubility of free nitrogen in the bromated lye. In order to eliminate this error it is, under all circumstances, advisable to make—previous to each actual analysis—a preliminary experiment with a known quantity of a standard solution of pure chloride of ammonium. For this purpose, 10 Gm. of the *pure* salt are dissolved in distilled water to measure 2,089.4 cubic centimeters, and portions of this, measuring 200 C.c. (or smaller quantities, according to the capacity of the measuring tubes to be used) are put up in suitable vials or tubes, ready for use. Each C.c. of such a solution corresponds to 1 C.c. of dry nitrogen at 0° C., and 760 Mm. pressure (nitrogen is calculated as 14.01, and chlorine as 35.368). 100 Gm. of chloride of ammonium then yield 26.24676 Gm. of nitrogen. [1,000 C.c. of nitrogen at 0° C. and 760 Mm. weigh 1.25658 Gm.] A series of trials should

be made with this standard solution, and the results compared with the yield required by theory. The difference, averaged from five or more closely agreeing trials, may be set down as the correction necessary to be applied when making an analysis of an unknown nitrogenized substance.

Additional Note on Strophanthus.

As a supplement to our note on Strophanthus, the new African cardiac remedy, published in our last number, p. 143, we print here some extracts from Thomas Christy's *New Commercial Plants and Drugs*, No. 9 (London, 1886), which extend our knowledge on the subject.

"It was at first supposed that the Kombé arrow poison was derived from the *Strophanthus hispidus;* but upon specimens being submitted to Professor Oliver, of Kew, he was led to doubt its identity with that plant, and described it as *Strophanthus Kombé.*

"As is frequently the case with new plants, the character of which is not generally known, a variety of Strophanthus, of a very inferior kind as regards its therapeutical action, has been sent over, and, fortunately for the reputation of the drug, the supplies were condemned before being circulated.

"I have instructed a collector to at once start for the interior and collect supplies of this important seed, and have taken steps to insure the collection of the true Kombé variety and its arrival in a sound condition.

"For some years I have supplied several medical men in this country and abroad with the seed pods, and have from time to time heard glowing accounts of its action in severe cases of fatty degeneration of the heart. In one case, when my supplies ran short, I received imploring letters, as the patient was dying for want of the drug." . . .

"Soon after the publication of Dr. Fraser's article in the *British Medical Journal*, I received a letter from Professor Fraser, in which he gives particulars for the guidance of those making the tincture.

"It is also important to note what he says as to some inferior seed pods having been imported into this country. It will be a most unfortunate thing if this parcel has been circulated amongst medical men, as it is certain to greatly damage the reputation of a drug which has so far given such excellent account of itself.

"As regards the probability of supplies, I have since July last year been on the alert, and two or three collectors have been endeavoring to get supplies for me. I had a parcel weighing about twenty ounces sent me in August last, which was speedily consumed. I have instructed a trustworthy collector to go into the interior especially to secure reliable supplies. Professor Fraser, under date of 7th December, 1885, write sme:

"DEAR SIR:—As you may soon be disposing of Strophanthus to druggists throughout the country, I wish to make some suggestions regarding the tincture to supplement the sentence on the subject in the *British Medical Journal.*

"I should there have stated that I use —and find it advisable to use—*rectified spirit,** and not proof spirit, in preparing the tincture. Of the various modifications I have tried in the preparation of the tincture, the one I prefer as yielding the best preparation is to pack the finely-ground seeds—after drying for some hours between 100° and 120° F.—in a percolator, pass washed ether through until it is colorless, or almost so, and then pass rectified spirit through, so as to obtain one pint of tincture for two and one-half ounces of seeds. The ether solutions are rejected, as they are inert and contain much fat.

"On the first addition of ether, and afterwards of rectified spirit, percolation is prevented for twenty-four hours, so as to allow of maceration of the powdered seeds. The dose of this tincture is from four to eight min. and it mixes with water without change.

"I have seen some strophanthus seeds which have lately been brought from Africa, that are not satisfactory.

"The pods have been gathered before they were ripe, and the seeds are extremely badly filled.

"These seeds would produce a very inferior tincture.

"What are the prospects of a supply being got? Numerous letters come to me on the subject.' . . .

"I have received some strophanthus from the Gold Coast and some from Sierra Leone, of which I give a few notes below.

"*Strophanthus Bullenians.*—This was received in the form of a mass of pod and seed tufts, with but very few seeds.

"From what I have been able to determine, the seeds are larger, measuring about three-eighths of an inch by one-eighth, and more corrugated than those of the S. Kombé. The tufts are entirely different to those of the latter variety, and could not possibly be mistaken.

"They have more the appearance of wool than of silky hairs. The pod, on the other hand, from what I can gather from the broken pieces, is very similar to that of the Kombé variety.

"*Strophanthus Sp.*—This was received from Lagos, and, like the above, is known as an arrow poison. The pod is about twelve inches long, and about six inches in circumference, with the appearance of the Kombé pod. The seed is light brown in color, slightly corrugated, pitted, and in shape like that of other varieties. In this variety the tuft is as distinct as it is in the Kombé, but instead of the stem being whitish, it is brown. The hairs, though white, have not the beautiful silkiness of the Kombé. I sent this variety to Kew, and other museums and herbariums, but it is one that is not, so far, classified. I have sent for the leaves and flower to enable it to be named."

* Brit. Pharm., that is alcohol of spec. gr. 0.838, containing 88.76% of absolute alcohol by volume.

What is the Best Tooth-powder?

MR. A. D. MACGREGOR, of Kirkcaldy, in an article on Boric Acid and the Affections of the Mouth, published in the *Brit. Med. Journ.*, makes the following remarks on tooth-powder:

"A tooth-powder should possess certain characteristics. It should be antiseptic, cooling, agreeable to taste and smell, and have no injurious action on the teeth. After use, it should leave the teeth white, and a sensation of freshness and cleanliness in the mouth. As an antiseptic in this connection, nothing can replace *boric acid.* For years I have used the following powder, and can recommend it:

" Boric Acid, finely powd.....	40 grs.
Chlorate of Potassium.....	60 "
Guaiac, powd.....	20 "
Chalk, prepared.....	60 "
Carbonate of Magnesium....300	"
Oil of Rose.....	1 drop.

"The boric acid in solution gets between the teeth and the edges of the gums, and there it discharges its antiseptic functions. The chlorate and guaiac contribute their quota to the benefit of the gums and mucous membrane generally. The chalk is the insoluble powder to detach the particles of tartar which may be present, and the magnesia the more soluble soft powder which cannot harm the softest enamel."—After *Pharm. Jour.*

Reduction of Ferric Salts.

THE following simple plan is suggested by Mr. A. L. Beebe, of New York: A strip of thin platinum foil, about one inch square, is perforated with pin-holes over its entire surface. It is then bent into the shape of a letter V, and its opposite corners are connected by short pieces of platinum wire, so as to form a sort of basket. In this is placed a piece of amalgamated zinc of convenient size, and the whole is suspended by a stout platinum or silver wire in the bottle containing the solution to be reduced. Another strip of platinum foil, about 1½x2½ inches in size, is then dropped into the bottle in such a way as to lean against the wire supporting the basket and zinc without coming into contact with the latter. Galvanic action at once commences, and hydrogen is evolved in abundance from the surface of the foil, which never becomes amalgamated, as it comes into indirect contact only with the zinc. When the reduction is complete, the platinum basket containing the zinc is removed from the solution, washed in the titrating beaker, and laid aside, all danger of fracturing the beaker being thus avoided. This is specially suitable in the determination of ferric iron by means of permanganate of potassium. —*Chem. and Drugg.*

Two New Sugar-Reactions.

MOLISCH has presented a paper to the Academy of Sciences, at Vienna, in which he reports two new, delicate reactions for sugar.

If a solution of sugar (about eight minims) is mixed with two drops of alcoholic solution of alpha-naphthol containing fifteen to twenty per cent of the latter, and concentrated sulphuric acid afterwards added in excess, on shaking there is immediately produced a deep violet color, and on subsequent addition of water a bluish-violet precipitate. If thymol is used instead of alpha-naphthol, the other conditions remaining the same, the coloration at first produced is vermilion or carmine, and the subsequent precipitate is in reddish-violet flakes.

These reactions occur with most varieties of sugar, for instance: cane-sugar, milk-sugar, grape-sugar, fruit-sugar, and maltose. Their delicacy is greater than that of any other test so far known.

Since the treatment of carbohydrates and glucosides with sulphuric acid results in the eventual production of sugar, the above-mentioned bodies afford the same reaction, either at once or after some time. Some glucosides (as indican) which, when split, furnish only sugar-like substances, but not sugar itself, do not respond to the reaction.

The above color tests are reported to be exceedingly useful for detecting sugar in urine. Normal human urine responds to the reaction very handsomely, and the test is still recognizable even after the urine has been diluted with between one hundred and three hundred volumes of water. This would appear to confirm Brücke's views, who maintains that glucose is a constant constituent of normal human urine.—After *Rundschau* (Prag).

Iodol and Iodol-Gauze.

IODOL, as a substitute for iodoform, does not seem to make much progress in this country. One of the chief objections is its high price. The other is, that it is by no means as stable as iodoform.

An iodol-gauze has recently been recommended to be prepared with the following solution:

Iodol...	1 part.
Rosin..... ..	1 "
Glycerin.....	1 "
Alcohol..... 10	parts.

A SIMPLE EXTRACTION-APPARATUS.

A SIMPLE apparatus for continuous extraction is recommended by Barthel. *A* is the extraction tube; *d* is an open thin-walled glass tube serving as an upright condenser, and *a b* is a glass tube which serves to convey the vapors of the boiling liquid in the flask (not shown in the cut) into the extraction tube and thence into the condenser. The curved tube *a b* is in two pieces—to facilitate the fitting together—the point of junction, at *c*, being protected by a piece of rubber tubing. The cork *r* is fitted into a flask in which the volatile liquid is heated, and into which the percolate from the extraction tube runs. When bisulphide of carbon, or other liquids acting upon rubber are used, the piece of rubber tubing at *c* must be replaced by a cork.

When the apparatus is made of larger dimensions, as, for instance, when the extraction tube has a capacity of about 100 C.c., it is better to use three different condensing tubes, instead of one. If these tubes have a length of about 6 feet, no loss of volatile liquid need be feared.—After *Pharm. Centralh.*, 27, 273.

Antiseptics in Pharmacy.

IN a recent paper by Dr. A. Poehl, of St. Petersburg, published in *Pharm. Zeit.*, the author discusses the methods at present in use to obtain liquids or solutions, free from bacteria or ferment bodies, for medical or surgical purposes. We quote the more interesting passages:

"The introduction of the salicylates of atropine, eserine [see note at end], etc., is due to these efforts to produce aseptic solutions [in ophthalmic practice], but they were not as successful as might have been expected.

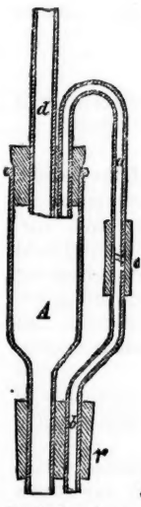
In our days a physician cannot do practice without hypodermics, and these should always be prepared under the precautions afforded by the aseptic method. The preparation of hypodermic injections in the modern pharmacies is accomplished without any antiseptic methods. *The very act of filtration through paper causes the filtrate to contain more micro-organisms than the unfiltered liquid contained.* To understand this it is only necessary to recall to mind the method by which such paper is prepared. A plain-folded filter, moreover, is even less objectionable than a plaited one, as the latter must be much more manipulated. . . . Dr. Hager has pointed out the dangers of septic hypodermic injections long ago, and has, among other things, recommended the employment of *doubly distilled* water, that is, such water as, after being once carefully distilled, is freed from all volatile organic matters by being treated with permanganate and then re-distilled.

While this doubly distilled water affords stable solutions of metallic salts, alkaloids require perhaps still further precautions, as they constitute, in themselves, a favorable nutriment for certain micro-organisms. The most effective way to sterilize all such solutions would be to raise them to boiling. But this is impracticable in the case of delicate alkaloids or glucosides, as they would be decomposed. The only rational method, therefore, which can be expected perfectly to accomplish the object, would be that of Tyndall (by discontinuous sterilization).

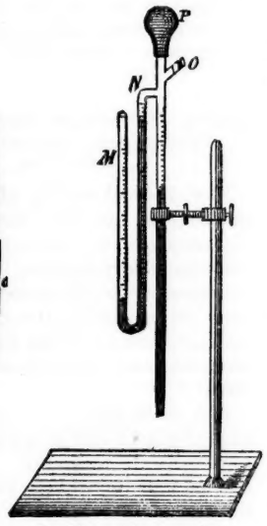
The addition of antiseptic substances to hypodermic solutions, for the purpose of sterilizing them, is not justifiable from the medical standpoint, although it is often recommended. *Free acids*, at least, are objectionable under all circumstances, and the presence of an antiseptic substance in quantity sufficient to be effective is by no means immaterial.

In the preparation of absolutely perfect hypodermic injections, therefore, the chief task will consist in most scrupulously applying all cautelæ requisite for obtaining sterilized liquids, the first condition being an absolutely pure distilled water, and another that no paper filter be used in the preparation. Finally, the finished solution must be sterilized either directly or discontinuously. All this, however, requires the utmost care and a perfect familiarity with the methods to be employed.

[The author gives only brief outlines of the method by which such sterilized solutions may be prepared. As it is evidently not possible for every pharmacist to adopt such methods, he recommends to keep the several hypodermic medicines on hand in form of granules, specially prepared under all possible antiseptic precautions, and containing, each, a known quantity of the remedy. By introducing one (or more of these) into the vial, previously sterilized by heat, and then adding the requisite quantity of pure doubly distilled water from a burette with glass stopper (and closed with cotton), a stable solution may be produced.]



Barthel's extraction apparatus.



Specific gravity apparatus

Finally, the author speaks of the efficacy of certain volatile antiseptics, particularly of *chloroform*, which he does not object to, as it is soluble in water only to a very small extent, while it is nevertheless capable, even in such high dilution, to prevent the development of bacteria. If to a solution thus rendered proof against bacteria by chloroform, there is further added an antiferment, such as benzaldehyde, cinnamic aldehyde, thymol, styrol, etc., etc., the resulting solution will be generally satisfactory, though it will depend, in each separate case, upon the nature of the substance itself, what kind of preservatives are most suitable.

[NOTE BY ED. AM. DR.—The salicylate of eserine was *not* introduced, primarily, on account of any supposed anti-fermentative action of the salicylic acid, but simply because the salicylate happens to be the most perfectly crystallized and least hygroscopic salt of eserine or physostigmine. It has indeed been shown that a solution of the sulphate of physostigmine, when kept for some time, is less liable to spoil than a solution of the salicylate kept equally long. But the sulphate is so hygroscopic that it is often impossible to weigh out more than one or two portions out of a fresh vial containing it, without running the risk of giving access to so much moisture as will prevent the remainder from being removed in a dry condition.]

APPARATUS FOR DETERMINING THE SPECIFIC GRAVITY OF LIQUIDS.

AN apparatus for taking the specific gravity of liquids, which is particularly valuable when only small quantities of liquid are available, has been devised by L. Amat.

It consists of a capillary tube *T*, the lower orifice of which is open, while the upper one is provided with a rubber ball. Laterally there are attached to it a small tubulure at *O* and a U-shaped tube *M*, which latter serves as a manometer. The tubes *T* and *M* are divided into millimeters. Supposing now that the manometer tube *M* is half filled with a liquid the specific gravity of which is exactly known, the tubulure at *O* then stoppered, and the pipette tube *T* inserted into the liquid (the specific gravity of which is to be taken), while the rubber ball *P* is slightly compressed. On releasing the pressure, a column of the liquid will ascend the tube *T*, but, at the same time, the standard liquid in the inside manometer tube *N* will rise likewise, the amount of rise depending upon its own gravity and that of the liquid under examination. In other words, the amount of liquid contained in the tube *T* (excepting so much as would naturally be retained at its orifice by capillary attraction) is *balanced* by the increase of the column of liquid in the inner manometer tube. Now, if we designate by

d, the spec. grav. sought;
a, the height (in millimeters) of the liquid drawn up in *T*;
d', the spec. grav. of the standard liquid in the manometer tube;
b, the difference of level (in millimeters) in the inner leg of the manometer,

then we have:

$$\frac{a}{b} = \frac{d'}{d}\text{; hence } d = \frac{b}{a}d'.$$

That is, the spec. grav. of the liquid under examination is found by dividing the rise of liquid (in millimeters) of the standard liquid, with the height (in millimeters) of the liquid in *T*, and multiplying the quotient with the spec. grav. of the standard liquid.

If the latter is water, which is generally assumed as 1, then the above formula becomes:

$$d = \frac{b}{a}$$

Owing to the capillarity of the tube *T*, which would retain a small amount of liquid near the point even when open above, it is necessary to make a correction. For this purpose the liquid is allowed to run out (by opening *O*), and the height (in millimeters) of the small column of liquid now retained (which we will designate by *c*) is read off. Consequently the above formula becomes, after correction:

$$d = \frac{b}{a - c}$$

In the apparatus described by the author, *c* amounts to 2–3 millimeters. The exactness of the apparatus depends upon its size and the correct calibration. The author gives figures which show that the second decimal may still be determined with accuracy by the apparatus. For instance, he quotes:

	With above apparatus.	With spec. grav. bottle.
Ether	0.745	0.743
Alcohol	0.813	0.816
Alcohol	0.815	0.816
Sulphuric Acid	1.834	1.836
Sulphuric Acid.	1.837	1.836

When making a series of determinations, particularly with one and the same liquid, but of different densities, the above-described apparatus promises to be quite useful and to save much time.—*Bull. Soc. Chim.*, Paris, 45, May 5th.

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EDITORIAL.

THE practice of medicine by druggists was the subject of a prosecution recently in the First District Police Court of New York, the proceedings having been instituted by the Medical Society of the County of New York, through its counsel. The facts as testified to by the witnesses for the prosecution were substantially as follows: A man got a splinter in his foot, and went to a drug-store for relief. The druggist declined to treat the case, and sent him to a doctor. Failing to find the doctor at home, he took the advice of a fellow-workman and went to the store of the defendants, one of whom ridiculed the idea of going to a doctor for such a trouble, examined the foot with a probe, advised festering instead of cutting, and sold the injured man a salve to be applied. This was on Wednesday. On the Friday following, the man visited the store again, and the other partner examined the foot, pronounced the condition of the sore not ripe enough, and advised the salve to be applied more freely. On the Monday following, a third visit was made to the drug-store, and the splinter was extracted with tweezers. The next day, the man's wife went to the store to get something to relieve her husband's suffering, and was told that her husband probably had erysipelas, and was sold a wash to be applied to the foot. On Wednesday—one week from the receipt of the injury—a physician was called to attend the case.

The defendants, on the other hand, testified that they did not apply salve with their own hands, or advise treatment. They also testified that the injured man asked for "a salve or something," and that the wife made her own choice of lotions.

The case was tried before a jury, and a verdict was rendered for the defendants.

We have given this short account of the case for the purpose of drawing a comparison between the course pursued by the two druggists. The first declined to have anything to do with the case, and suffered no further annoyance than the loss of a customer. The others, in order to sell forty cents' worth of medicine, placed themselves in the position of becoming liable for infringement of the law governing the practice of medicine, and were subjected to the annoyance and costs of defending themselves in a suit brought about through the efforts of the County Medical Society; to say nothing of gaining (whether justly or unjustly) a reputation among the physicians in their neighborhood for being "counter prescribers." Does it pay?

Action of German Physicians and Pharmacists Against Secret Remedies.

THE Medical Society of the district of Leipzig, and the Association of Pharmacists of Leipzig and surrounding districts, have recently held a convention for the purpose of taking some action against the spread or encouragement of secret remedies, and have adopted the following regulations:

1. It is the business of physicians to cure the sick; that of the pharmacists to prepare the medicines.

2. *a.* The physicians pledge themselves not to recommend any secret remedies to their patients.

b. The pharmacists agree not to issue any announcements or bombastic advertisements of secret remedies, nor to attach their own or their firm name to such as mention the diseases or complaints the remedy is supposed to cure.

3. The patronage given by physicians to wholesale houses is to be antagonized in every possible way, as being opposed to the public interest.

It will be seen from these resolutions that, in spite of the supposed government supervision of the matters relating to medicine and pharmacy, our German confrères are no better off in this respect than we are on this side of the Atlantic. In fact, for a number of years past, there has been an evident tendency on the part of many German physicians to patronize certain proprietary articles, or to make propaganda for the products of certain manufacturers. This country has often been held up to ridicule because it was said that almost anything in the shape of a nostrum could find medical sponsors to vouch for its superior quality. To a certain extent this may have been true, but on examination it will be found that almost every one of these medical backers belongs to the class of nobodies. The names of recognized authorities, or of reputable practitioners, are met with under similar circumstances with much greater rarity. Impartial observers must have noticed that this proportion or relation in the character of medical supporters is decidedly different in Germany, as well as in some other continental countries. We meet there the most prominent and renowned names among the medical profession, even professors at universities, openly and confessedly publishing papers, addresses, circulars, and pamphlets supporting the supposed claims of some special form of medicine, or the preparations of a certain manufacturer, or the management of a certain institution, etc. In fact, quite a number of these documents bear the evident stamp of an advertising dodge.

However, this is a subject which deserves a much fuller treatment than can be given to it here. It has been incidentally mentioned, because the prevalence of the evil, and the consequent necessity of trying to suppress it, is shown by the fact that the second of the above-quoted resolutions (2, *a*) has been adopted by a joint convention of German physicians and pharmacists.

The Carlsbad Mineral-Water Lease.

IN response to their advertisement soliciting tenders for the lease of the Carlsbad mineral springs, the local authorities have received eight applications, one of which, however, is debarred from competition through arriving after the appointed time. Karl Karuth August Boden, and others, at Hamburg, offer an annual rent of 126,500 fl.; A. M. Pick, of Prague, 120,000 fl. per annum, plus 50 per cent of the net profits; Julius Prince, of the London Apollinaris Company, 150,000 fl. per annum, and 575,000 fl. for advertising during fifteen years; Heinrich Mattoni, of Carlsbad, 120,000 fl. per annum; Louis Pacully and Samuel Wernersen, of Breslau, 150,000 fl. per annum; Julius Schottlaender, of Breslau (the representative of the firm Loebel Schottlaender, the present lessees), 175,000 fl.; and Eisner and Rosokau, in Philadelphia, 140,000 fl. for the first year, with an annual increase. A decision will shortly be taken. The springs are now leased at 70,000 fl. per annum.—*Chem. and Drugg.*

Zinc Reported in American Dried Apples.

J. STINDE reports (in *Industrieblätter*, 1886, 116) that American sliced and dried apples often contain zinc. This contamination is said to be caused by the preliminary treatment of the peeled apples, which are placed in galvanized (zinc-coated) iron baskets and dipped into salt water, after which they are immediately transferred to the frames of the drying-chambers, the bottoms of which consist of zinc [galvanized iron?] wire-gauze. The object of dipping the apples in salt water is to prevent them from becoming yellow or brown. The whiter the apples appear the more necessary it is, according to Stinde, to insure the absence of zinc.

SELECTIONS FROM THE REVISED HOSPITAL FORMULARY

OF THE DEPARTMENT OF PUBLIC CHARITIES AND CORRECTION OF THE CITY OF NEW YORK.

(Continued from page 149. *)

[TONIC MIXTURES CONTINUED.]

47. *Mistura Strychninæ.*

Hall's Strychnine Mixture (Modified).

℞ Strychninæ Acetatis.....gr. 1
Tinct. Cardamomi Comp..fl. dr. ½
Alcohol,
Aquæ.....āā fl. dr. 2½
Syrupi ..... q. s. ad fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful.

48. *Mistura Tonica (Bell. Hosp.).*

"*Special Tonic.*"

℞ Quininæ Sulphatis... .....gr. 30
Tinct. Nucis Vomicæ,
Tinct. Ferri Chloridi ....āā ♏ 160
Acidi Phosphor. Dil .....fl. ℥ 1
Syrupi .....q. s. ad fl ℥ 4

Dissolve and mix.
Dose: A teaspoonful.

49. *McCann's Tonic.*

℞ Liquoris Ferri et Quininæ Citratis (U. S. Ph.),
Tinct. Nucis Vomicæ..āā fl. dr. 2
Syr. Hypophosphitum. ..fl. ℥ 3

Mix.
Dose: A teaspoonful before meals. (Dr. B. H. McCann.)

50. "*Phthisis Tonic*" (*Bell. Hosp.*).

℞ Tinct. Zingiberis.....fl. dr. 1
Sodii Bicarbonatis.....dr. 2
Tinct. Gentian. Comp.q.s. ad fl. ℥ 5

Dissolve and mix.
Dose: A teaspoonful. (Dr. A. L. Loomis.)

51. *Smith's Bitters.*

℞ Tinct. Cinchonæ Comp.,
Tinct. Gentianæ Comp,..āā fl. ℥ 2

Mix.
Dose: A teaspoonful.

52. *Thomson's Tonic.*

℞ Ferri et Ammonii Citratis...gr. 64
Acidi Hydrochlorici.....♏ 30
Glycerini.....fl. 1½
Aquæ.....q. s. ad fl. ℥ 4

Dissolve and mix
Dose: A teaspoonful. (Dr. W. H. Thomson.)

53. "*Ward Iron*" (*Char. Hosp.*).

℞ Tinct. Ferri Chloridi,
Syrupi.....āā fl. ℥ 1
Aquæ.... ... .fl. ℥ 2

Mix.
Dose: A teaspoonful.

54. "*Ward Tonic*" (*Bell. Hosp.*).

℞ Ferri et Quininæ Citr.,
Ferri et Strychninæ Citr..āā dr. 2
Infusi Calumbæ.....fl. ℥ 16

Dissolve and mix.
Dose: A tablespoonful (containing nearly 1-28th grain of strychnine).

55. "*Ward Tonic*" (*Fothergill's*) (*Char. Hosp.*).

℞ Quininæ Sulphatis.....gr. 16
Strychninæ Sulphatis... ....gr. ½
Potassii Citratis ....gr. 90
Tinct. Ferri Chloridi.....fl. dr. 5
Syrupi..... .....fl. ℥ 1
Aquæ.....q. s. ad fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful.

56. *Loomis' Tonic* * (*Char. Hosp.*).

℞ Quininæ Sulphatis .....gr. 15
Tinct. Ferri Chloridi.....fl. dr. 2
Spir. Chloroformi.....fl. dr. 3
Aquæ.... .....fl. ℥ 1
Glycerini..... ...q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.

57. *Mistura Cinchoninæ Sulphatis (Bureau O. D. P.).*

℞ Cinchoninæ Sulphatis.....gr. 60
Acidi Sulphurici Dil .... q. s.
Aquæ ....q. s. ad fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful.

[*Note.*—This mixture is one of those which are dispensed to a certain class of would-be patients who make the rounds of the different dispensaries, and whose statements are either suspected or known to be exaggerated. There are various devices adopted to entrap such fraudulent pensioners, but each dispensary has its own methods, and it is preferable not only that these should be kept private, but also that they be changed from time to time.]

58. *Mistura Ferri Chloridi (Ins. As.).*

℞ Tinct. Ferri Chloridi,
Tinct. Nucis Vomicæ.....fl. ℥ 1
Syr. Hypophosphitum.....fl. ℥ 8
Aquæ ..... .q. s. ad fl. ℥ 16

Mix.
Dose: 2 teaspoonfuls three times daily.

59. *Mistura Ferri Composita (Griffith's Mixture, Modified).*

℞ Ferri Sulphatis..... .. gr. 20
Potassii Carbonatis. .....gr. 25
Myrrhæ,
Sacchari .....āā dr. 1
Tinct. Lavandulæ Comp..fl. dr. 4
Aquæ Cinnamomi.q. s. ad fl. ℥ 8

Dissolve and mix.
Dose: 1 to 2 fluidounces.

Prepare as directed by the U. S. Pharm., 1880. The officinal formule directs Spirit of Lavender. In tha practice of the Department, the Compound Tincture of Lavender is generally used.

Note.—If this mixture is to be kept in stock, the sulphate of iron is to be left out, and the remaining mixture made up only to 7½ fl. oz. (or a multiple thereof). When it is to be dispensed, say in quantities of 4 fl. oz., the following proportions are required:

Sulphate of Iron.....gr. 16
Water..... fl. dr. 2

Dissolve and add enough stock mixture to make 4 fl. oz.

60. *Mistura Ferri et Quininæ Citratis (Ins. As.).*

℞ Ferri et Quin. Citrat.....dr. 3
Tinct. Nucis Vom.....fl. dr. 5
Syr. Hypophosphitum.....fl. ℥ 8
Aquæ.....q. s. ad fl. ℥ 16

Dissolve and mix.
Dose: A teaspoonful.

61. *Mistura Ferri et Strychninæ (Bell. Hosp.).*

℞ Strychninæ Sulphatis.....gr. 1
Ferri et Quin. Citrat.....dr. 3
Ferri Pyrophosphat... .... dr. 2
Tinct. Gentian. Comp.,
Aquæ.....āā fl. ℥ 4

Dissolve and mix.
Dose: 2 teaspoonfuls.

62. *Mistura Pyrophosphatis (Ins. As.).*

℞ Ferri Pyrophosphatis.....gr. 150
Tinct. Nucis Vomicæ..... ♏ 200
Hydrargyri Bichloridi.....gr. 1
Tinct. Cinchonæ Comp.,
Syrupi.....āā fl. ℥ 5

Dissolve and mix.
Dose: 2 teaspoonfuls.

Supplement to A.

The following formulæ, which were omitted in our last number for various reasons, are inserted here by request of a number of our readers:

(MIXTURES FOR DISEASES OF THE RESPIRATORY ORGANS.)

63. *Mistura Ammonii Chloridi (Bureau O. D. P.).*

℞ Ammonii Chloridi,
Potassii Chloratis.....āā gr. 30
Syr. Senegæ.....fl. dr. 4
Syr. Ipecacuanhæ .....fl. dr. 3
Syr. Tolutani.....fl. dr. 5
Ext. Glycyrrhizæ .....gr. 60
Aquæ Cinnamomi.q. s. ad fl. ℥ 4

Dissolve and mix.
Dose: A teaspoonful, for children. (Dr. G. H. Bosley.)

64. *Mistura Antasthmatica (Fothergill's).*

℞ Ammonii Iodidi.....gr. 120
Ammonii Bromidi.....gr. 120
Syr. Tolutani .....fl. ℥ 3
Tinct. Lobeliæ.....fl. ℥ 5

Dissolve and mix.
Dose: A teaspoonful.

65. *Mistura Codeinæ Hydrocyanica (Bell. Hosp.).*

℞ Acidi Hydrocyanici dil.....♏ 16
Codeinæ..... ... ...gr. 4
Ext. Pruni Virg. Fl.....fl. ℥ 1
Aquæ.....q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.

66. *Mistura Extracti Opii (Bell. Hosp.).*

℞ Extracti Opii,
Extr. Belladonnæ.....āā gr. 2
Chloroformi Purificati.....♏ 15
Syrupi.....fl. ℥ 1
Aquæ.....q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.

67. *Mistura Hydrobromica.*

℞ Acidi Hydrobromici diluti (10%)...♏ 30
Spir. Chloroformi .....♏ 20
Syr. Scillæ..... ... .fl. ℥ 1
Aquæ.....q. s. ad fl. ℥ 1

Mix.
One dose: To be taken twice or thrice daily, for cough.

68. *Spiritus Duo (Char. Hosp.).*

℞ Spir. Ætheris Comp.,
Tinct. Lavand. Comp.....āā part æqu

Mix.
Dose: A teaspoonful.

C. MIXTURES FOR DISEASES OF THE DIGESTIVE ORGANS.

68. *Diarrhœa Mixture (Hart's Isl. Hosp.).*

℞ Tinct. Capsici.....fl. dr. 1
Spir. Menthæ Pip.... ....fl. dr. 2
Tinct. Opii.....fl. dr. 3
Tinct. Catechu Co.,
Tinct. Kino,
Tinct. Krameriæ,
Spir. Camphoræ,
Aquæ.....āā fl. dr. 4

Mix.
Dose: 30 to 60 minims.

69. "*Diarrhœa Mixture, Loomis.*"

℞ Tinct. Lavandulæ Comp..fl. ℥ 2
Tinct. Opii,
Tinct. Rhei.....āā fl. dr. 4
Olei Sassafras.....gtt. 40

Mix.
Dose: A fluidrachm after each movement. Should it fail to act, add tinct. catechu fl. ℥ 1.

70. "*Diarrhœa Mixture, Squibb.*"

℞ Tinct. Opii,
Tinct. Capsici,
Spir. Camphoræ.. ...āā fl. dr. 2
Chloroformi Purificati.....♏ 45
Alcohol.....q. s. ad fl. dr. 10

* *Correction:* In the foot-note on page 148, first column, read: Lun. As. = Lunatic Asylum (*Blackwell's Island*) instead of (*Ward's Island*).

* The succession of formulæ is not the same in this reprint as in the original. Some of them had been omitted in our last number, and are here inserted as a supplement, by request.

Mix.
Dose: 20 to 40 minims.
Note.—This mixture was originally introduced and is still sold under the title "compound tincture of opium." But it is not advisable to write for it by this name, or by its Latin equivalent, *Tinctura Opii Composita* ("*Tr. Opii comp.*"), since cases have occurred when it was dispensed by mistake for *Tinctura Opii Camphorata* ("Tr. Opii Camph.").

71. "*Diarrhœa Mixture, Velpeau.*"

℞ Tinct. Opii,
Tinct. Catechu,
Spir. Camphoræ....āā part. æqu.
Mix.
Dose: 30 drops in water after each evacuation. If diarrhœa persists or increases, double the dose.

72. *Guttæ Carminativæ* (*Char. Hosp.*). "*Hot Drops.*"

℞ Tinct. Opii,
Tinct. Capsici,
Spir. Camphoræ,
Spir. Menthæ Pip.. .. āā fl. dr. 2
Aquæ. .....fl. ℥ 1
Mix.
Dose: A teaspoonful.

73. *Mistura Aloes Alkalina. Alkaline Mixture of Aloes.*

℞ Extr. Aloes Aquosi.....gr. 75
Sodii Bicarbonatis.....℥ 1½
Spir. Lavandulæ Comp..fl. dr. 4
Aquæ.....q. s. ad fl. ℥ 16

Dissolve the extract and the bicarbonate of sodium in 12 fluidounces of water; add the compound spirit of lavender; and finally enough water to make 1 pint, and filter.
Dose: 1 fluidrachm to 1 fluidounce, half an hour after meals, for costiveness.

74. *Mistura Anticholerica.* "*Sun Mixture.*"

℞ Tinct. Opii,
Tinct. Capsici,
Tinct. Rhei,
Spir. Camphoræ,
Spir. Menthæ Pip...āā part. æqu.
Mix.
Dose: 20 to 60 minims.

75. *Mistura Antidiarrhœica* (*Bureau O. D. P.*).

"*Diarrhœa Mixture* (*Child's*)."

℞ Tinct. Opii,
Spir. Camphoræ.....āā ♏ 32
Spir. Menthæ Pip.....♏ 64
Tinct. Catechu Comp.. ..fl. dr. 3
Mist. Cretæ.....q. s. ad fl. ℥ 2
Mix.
Dose: A teaspoonful. (Dr. G. H. Bosley.)

76. *Mistura Antidysenterica.* (*Mistura Camphoræ Acida—Hope's Camphor Mixture.*)

℞ Acidi Nitrici..... .....♏ 60
Tinct. Opii.....♏ 40
Aquæ Camphoræ, q. s. ad. fl. ℥ 8
Mix.
Dose: A tablespoonful, increased to 1 or 2 fluidounces every three hours, in dysentery.
Note.—The original formula directed "nitrous acid," meaning the impure commercial nitric acid, containing nitrous oxide in solution.

77. *Mistura Anti-emetica* (*Char. Hosp.*).

℞ Creasoti .....♏ 12
Acidi Hydrocyanici Dil.....♏ 30
Acaciæ pulv.,
Sacchari pulv.....āā dr. 6
Aquæ .....q. s. ad fl. ℥ 2
Mix.
Dose: A teaspoonful.

78. *Mistura Gentianæ Alkalina.*

℞ Sodii Bicarbonatis.....gr. 120
Acidi Hydrocyanici Dil.....♏ 24
Infusi Gentianæ Comp....fl. ℥ 8
Mix.
Dose: ½ to 1 fluidounce, in gastric intolerance of phthisis, etc.

Note.—Infusum Gentianæ compositum (Brit. Pharm.) is prepared by infusing 60 grains each of gentian and bitter orange peel, and 115 grains of fresh lemon peel, all properly sliced or cut, in 10 fluidounces (U. S. measure) of boiling water, and straining after one hour.

79. *Mistura Naphthalini* (*Bell. Hosp.*). *Naphthalin Diarrhœa Mixture.*

℞ Naphthalini Recryst..... gr. 3?0
Tinct. Capsici.....gtt. 16
Olei Menthæ Pip.....gtt. 2
Alcohol,
Mucilag. Acaciæ.....āā fl. ℥ 1

Dissolve the naphthalin in the alcohol; add the tincture and oil; and lastly, mix with the mucilage. Shake the mixture well before dispensing.
Dose: 2 fluidrachms.
Note.—Commercial naphthalin is not pure enough for internal administration. Only the recrystallized naphthalin should be used.

80. *Mistura Olei Ricini* (*Bureau O. D. P.*).

℞ Olei Ricini,
Syrupi Acaciae,
Syr. Ipecac.,
Tinct. Opii Camph.....āā fl. dr. 2
Mix.
Dose: A teaspoonful. (Dr. J. E. Winters.)

81. *Mistura Opii, Rhei et Camphoræ* (*Bureau O. D. P.*).

℞ Tinct. Opii,
Tinct. Rhei Aromat.,
Spir. Camphoræ.....āā fl. dr. ½
Tinct. Cardam. Comp....fl. dr. 2
Aquæ Anisi.....q. s. ad fl. ℥ 4
Mix.
Dose: A teaspoonful for children, in diarrhœa. (Dr. G. H. Sweezey.)

82. *Mistura Rhei Composita.*

℞ Ext. Rhei Fl.....♏ 16
Ext. Ipecac Fl..... .....♏ 3
Sodii Bicarbonatis.....gr. 32
Glycerini.....fl. dr. 6
Aquæ Menthæ Pip.....fl. ℥ 2
Mix.
Dose: ½ to 1 teaspoonful, 2 or 3 times a day, for children. (Dr. E. R. Squibb.)

83. *Mistura Rhei et Calcis* (*Bureau O. D. P.*).

℞ Tinct. Opii Camphor.,
Syr. Rhei Aromat.. .. āā fl. dr. 4
Liquoris Calcis.... .....fl. ℥ 2
Mix.
Dose: A teaspoonful for children, in diarrhœa. (Dr. W. H. Ackerman.)

84. *Mistura Rhei et Sodæ* (I.) (*Bell. Hosp.*).

℞ Sodii Bicarbonatis..... gr. 60
Rhei pulv.... .....dr. 4
Spir. Menthæ Pip.....fl. dr. 2
Aquæ .....q. s. ad fl. ℥ 4
Mix.
Dose: A teaspoonful.
Note.—The officinal *Mist. Rhei et Sodæ* is also prescribed. See the succeeding formula.

85. *Mistura Rhei et Sodæ* (II.) (*Bureau O. D. P.*).

℞ Sodii Bicarbonatis..... ....gr. 60
Extr. Rhei Fl.,
Spir. Menthæ Pip.....āā fl. dr. 1
Aquæ .....q. s. ad fl. ℥ 4
Mix.
Dose: A teaspoonful.
Note.—This is practically identical with the officinal preparation.

86. *Mistura Sodæ et Menthæ.* "*Soda Mint.*"

℞ Sodii Bicarbonatis.....gr. 80
Spir. Ammon. Arom.....♏ 15
Aquæ Menthæ Vir.....fl. fl. 4
Dissolve and filter.
Dose: A tablespoonful.

87. *Mistura Sodii Bicarbonatis* (*Bureau O. D. P.*).

℞ Sodii Bicarbonatis.....℥ 1
Tinct. Zingiberis .....fl. dr. 2
Tinct. Gentian. Comp.....fl. 1
Aquæ.... .....fl. ℥ 5
Dissolve and mix.
Dose: Two teaspoonfuls.

88. *Mistura Stomachica* (*Bell. Hosp.*)

℞ Tinct. Nucis Vomicæ,
Tinct. Capsici.....āā fl. dr. 1
Tinct. Cinchon. Comp.,
Tinct. Gentian. Comp...āā fl. ℥ 1
Mix.
Dose: A teaspoonful before meals.

89. *Mistura Sulpho-Alkalina* (*Bureau O. D. P.*).

℞ Sulphuris Loti,
Potassii Bitartratis,
Sodii Bicarbonatis,
Potassii et Sodii Tartr.āā part. æqu.
Mix.
Dose: A tablespoonful, mixed with sweetened water. (Dr. E. A. Maxwell.)

90. *Mistura Tænicida* (*Schafhirt's*) (*Bell. Hosp.*).

℞ Granati (Rad. Cort.)..... ℥ ½
Peponis.... 1
Oleoresinæ Aspidii... ....fl. dr. 2
Ergotæ Pulv.....dr. ½
Acaciæ Pulv.....dr. 2
Olei Tiglii.....gtt. 2
Water.....q. s.

Bruise the pomegranate-root bark and the pumpkin seed, and boil in 8 fluidounces of water for 15 minutes; then strain. Rub the crotonoil with the oleoresin of aspidium, the powdered ergot and acacia, and add to this the decoction.
Administration: Give a saline cathartic the night before, direct the patient to eat no breakfast, and at 10 A.M. administer the above mixture as *one dose.*

91. "*Ward Cathartic*" (*Char. Hosp.*).

℞ Magnesii Sulphatis.... 1
Syrupi.....fl. 2
Aquæ.....q. s. ad fl. 4
Mix.
Dose: 1 to 2 fluidounces.

92. "*West's Mixture.*"

℞ Olei Ricini.... ....fl. dr. 2
Acaciæ Pulv.,
Sacchari Pulv.....āā dr. 2
Tinct. Opii.....♏ 24
Aquæ Cinnamomi.....fl. ℥ 4
Dissolve and mix.
Dose: A teaspoonful, for children, in diarrhœa.

D. MIXTURES FOR DISEASES OF THE NERVOUS SYSTEM.

93. "*Delirium Mixture.*"

℞ Potassii Bromidi..... ...dr. 2
Tinct. Lupulini,
Tinct. Digitalis.....āā fl. dr. 2
Tinct. Valerian. Ammon..fl. dr. 4
Aquæ.....q. s. ad fl. ℥ 2
Dissolve and mix.
Dose: A teaspoonful.

94. *Mistura Anti-Epileptica.*

℞ Sodii Bromidi,
Potassii Bromidi,
Ammonii Bromidi.....āā dr. 3
Potassii Iodidi,
Ammonii Iodidi.....āā dr. 1½
Ammonii Carbonatis.....dr. 1
Tinct. Calumbæ.....fl. ℥ 1½
Aquæ.....q. s. ad fl. ℥ 8

Dissolve and mix.
Dose: 1½ fluidrachms before meals, and 3 fluidrachms at bed-time. (Dr. Brown-Séquard.)

95. *Mistura Chloral et Potassii Bromidi.*

℞ Chloral	gr. 80
Potassii Bromidi	gr. 160
Syrupi	fl. ʒ 1
Aquæ	q. s. ad fl. ℥ 2

Dissolve and mix.
Dose: A teaspoonful.
Note.—When bromide of potassium, bromide of ammonium, or similar salts are combined in one mixture with chloral hydrate, no tincture or other liquid containing a notable proportion of alcohol ought to be added, as the chloral hydrate is liable, under certain conditions, to be converted into chloral alcoholate, the solution of which will float upon the solution of the salts.

96. *Mistura Ergotæ Composita.* (*Ins. As.*)

℞ Extr. Ergotæ Fl.	♏ 30
Potassii Bromidi	gr. 20
Extr. Hyoscyami Fl.	♏ 25
Aquæ	q. s. ad fl. ʒ 1

Dissolve and mix.
One dose, three times daily. In maniacal excitement of chronic and recurrent mania.

97. *Mistura Nervina.* (*Hammond's or Vance's Mixture.*)

℞ Quininæ Sulphatis, Ferri Pyrophosphatis	āā dr. 1
Strychninæ	gr. 1
Acidi Phosphorici diluti.	fl. dr. 2
Syrupi Zingiberis	fl. ℥ 2
Aquæ	q. s. ad fl. ℥ 4

Add the pyrophosphate of iron to 1 fluidounce of hot water, and dissolve it by agitation. Mix the sulphate of quinine and the strychnine with the diluted phosphoric acid and the syrup of ginger. Then pour the two solutions together, and add enough water to make the product measure 4 fluidounces.
Dose: A teaspoonful.
Note.—The officinal phosphoric acid is the tribasic or orthophosphoric acid. This is incompatible with pyrophosphate, and to some extent also with phosphate of iron (both in scales), as it does not dissolve them, or precipitates them when in solution, in form of a gelatinous mass. The kind of acid required for mixtures containing the above salts in solution is the so-called *glacial* acid, which consists chiefly of metaphosphoric acid. For preparing mixtures like the above, a special diluted phosphoric acid should be kept in stock, prepared as follows:

Glacial Phosphoric Acid	ʒ 1
Water, enough to make	fl. ℥ 10

98. *Mistura Phosphori* (*Thompson*). *Thompson's Solution of Phosphorus.*

℞ Phosphori	gr. 1
Alcohol Absoluti	fl. dr. 5
Glycerini	fl. ʒ 1½
Alcohol	fl. dr. 2
Spr. Menthæ Pip.	♏ 40

Dissolve the phosphorus in the absolute alcohol with the aid of a gentle heat; then add to it the glycerin, alcohol, and spirit of peppermint, previously mixed and slightly warmed.
Each fluidrachm contains nearly one-twentieth grain of phosphorus.—Dr. J. Ashburton Thompson.

[To be continued.]

Deodorizing Sulphide of Potassium.

The disagreeable odor of sulphide of potassium, when used for lotions or baths, may be covered, according to *Pharm. Centralh.*, by combining it with tincture of benzoin, as follows:

Sulphide of Potassium	1 part
Tincture Benzoin	1 "
Distilled Water	100 parts

Dissolve and mix.

SELF-FILLING BURETTE.

We have given several forms of burettes which may be filled by an automatic motion or at least a simple pressure or action of the operator without requiring him to watch the upper level of the liquid. In the accompanying cut we illustrate another form of such a burette, designed by Dr. Dafert. *d* is connected with the reservoir of the test-liquid. By opening the pinch-cock, the liquid will flow into and ascend in the burette until it will run out through *c*, and all excess will flow off through the tube *a* into any suitable vessel that may be set underneath it. In some cases the excess may be allowed to flow back into the stop-bottle; in others, it will be best to throw away the overflowed portion altogether. Any such arrangement is extremely convenient where large numbers of volumetric determinations are to be made with one and the same liquid. It has the only drawback that the upper level is never exactly at the same mark, and that, therefore, the first half cubic centimeter cannot be read off with absolute accuracy.—After *Chem. Zeit.*

DETERMINING THE MELTING POINT OF FATS.

R. Bensemann recommends to employ a melting-tube of the shape shown in the cut. Its lower half is of very narrow diameter, while just above this the tube is slightly enlarged to a bulb. The fat to be examined is introduced into the tube, and, by proper manipulation, caused to congeal in form of a bead in the expanded portion. The tube is then inserted into a water-bath, and the moment

watched when the bead of fat drops off and falls upon the lower portion of the bulb. This is the point of incipient melting.
The following determinations among others, have been made by the author:

	Incipient melting point.	Percentage of water in soluble fatty acids
Imitation Butter (Dutch).	21–22°C.	94.71
Beef-tallow	45–46°C.	95.57
Mutton-tallow	50–51°C.	95.54
Lard	45–46°C.	95.80
Cow's butter	34–35°C. / 34–36°C.	88.14—88–96

—After *Rep. f. Anal. Chem.*

To dye ivory red with fuchsine, dip the object—for instance, a billiard ball—for an instant into nitric acid, wash it with much water, and then immerse it in an alcoholic solution of fuchsine. The color becomes immediately fixed.

The Presence of a Reducing Agent, probably Hydrogen Peroxide, in Natural Water.

According to Prof. Ramsay, distilled water, as well as ordinary tap water, has a reducing action on potassium permanganate. The amount of the reducing agent is increased by evaporation, even when all possibility of contamination with solid organic impurity is excluded. The amount of reduction is far too great to be ascribed to the nitrites present in the water. The experiments described in the paper show under what circumstances and to what extent this substance—which is probably hydrogen dioxide—is produced. If this supposition be correct, and the active substance in natural water be really hydrogen peroxide, it becomes of importance to ascertain its action on organic impurities contained in many natural waters.
Experiments were therefore made quantitatively on the action of dilute solutions of peroxide of hydrogen on urea, and it was found that the urea is slowly oxidized on standing; the rate of this action has also been measured. (Comp. H. B. Dixon, *Chem. Soc. Trans.*, 1886, p. 108.)—*Chem. News.*

Smoked Apparatus.

La Nature suggests a method of obviating, to some extent, the frequent washings of apparatus which are sometimes requisite in chemical manipulations. It consists in the use of small porcelain capsules that have received a coat of lamp-black by being held in the smoky flame of a candle. A drop of water or aqueous saline solution placed carefully in such a smoked capsule will retain the spheroid form, which is maintained on the addition to this globule of another drop, or a particle of a solid reagent; and allows of any phenomenon of coloration, precipitation, or crystallization being closely observed. At the conclusion of the experiment, the globule may be thrown out of the capsule, leaving it quite clean and ready for another experiment. The carbonaceous coating is, however, attacked by acid, alcoholic, and ethereal liquids, so that the method is only available in the case of certain aqueous solutions. This mode of operation may also be extended to certain leaves which are not wetted by water and some solutions,—a good instance of which is the nasturtium (*Tropæolum*) leaf.—*Pharm. Journ.*

Subchloride of Silver.

It has commonly been supposed that, when chloride of silver is blackened by light, there is produced a lower chloride, the so-called subchloride of silver, and as a second step, metallic silver. Spencer B. Newbury (*Amer. Chem. Journ.*), however, after making experiments tending to test the accuracy of this assumption, has arrived at the conclusion that no subchloride, but only metallic silver is formed under the circumstances. In fact, he demonstrates conclusively that none of the previous observers, who have described subchloride of silver, have had this substance under their hands. It is, therefore, highly probable that the compound has no existence at all.

Wood Oil.

Wood oil is now made on a large scale in Sweden from the refuse of timber cuttings and forest clearings, and from stumps and roots. Although it cannot well be burned in common lamps on account of the excessive amount of carbon it contains, it furnishes a satisfactory light in lamps specially made for it, and in its natural state is the cheapest of all illuminating oils. Thirty factories produce about 40,000 liters of the oil daily.—*Chem. and Drugg.*

Pure Aconitine.*

HAVING supposed for several years past that we had obtained by Duquesnel's method the pure toxic alkaloid of aconite, in the full quantity in which it exists in the root, we are now shown by Alexander Jürgens that a still purer substance may be obtained by an improved process. According to Jürgens, it is by no means necessary to add tartaric acid to the extracts prepared from the root, since this addition may possibly split up the alkaloid, and the pure alcoholic extract alone possesses already a sufficiently acid reaction. Consequently, the finely powdered root may at once be extracted with four times its weight of alcohol of 90 to 91 per cent. After separation of the green oil, and removal of the fat and portion of the coloring matter, by shaking the acid extract with ether, the *aconitoxine* (as the pure alkaloid is called) is obtained by rendering the extract alkaline with bicarbonate of sodium, and then shaking with ether—so far agreeing with the process of Duquesnel.

Jürgens, however, reduces the alkaline residue left after the evaporation of the ether to complete dryness, in as perfect a vacuum as possible, and at a temperature not exceeding 60° C. (140° F.). The next step is to add five times its weight of water to the residue, then hydrochloric acid in drops until the reaction just begins to be acid. The liquid is now filtered, whereby the dissolved hydrochlorate of aconitoxine is almost completely freed from a brown resin which accompanies it with extraordinary avidity. At the same time, no loss of alkaloid is experienced, which would be unavoidable if the usual methods of purifying by recrystallization, conversion into a salt, and reprecipitation were followed. On adding bicarbonate of sodium to the aqueous solution of hydrochlorate of aconitine obtained, and shaking it with ether, the alkaloid is obtained in crystalline crusts, having only a yellowish tint. This is next converted into the crystalline hydrobromate, the base again separated from this, and, having been reduced to a fine powder, it is mixed with twice its weight of absolute alcohol, macerated one day and filtered. The residuary alkaloid is once more treated in the same manner with absolute alcohol, and the white crystalline powder finally remaining recrystallized from ether. A considerable portion of the alkaloid originally present—about 10 per cent of the quantity otherwise obtained—may be extracted from the fatty substances that had been separated, by shaking them with acidulated water, rendering the solution alkaline, and shaking with ether. The total yield obtained by Jürgens amounted to 0.2 per cent of pure aconitoxine, while Wright and Luff obtained only 0.03 per cent, that is, only one-sixth or one-seventh of the quantity which Jürgens obtained. The process devised by the latter is, therefore, much more advantageous, particularly as the product is equally pure.

The results of the ultimate analysis prove that the new product is, indeed, of equal purity. Various determinations of nitrogen, as well as the analysis of the double gold salt (which was obtained both in an amorphous and a crystalline condition), led to values which agreed well among themselves, though they differed slightly from the figures obtained by Wright and Luff. According to Jürgens, the alkaloid has the composition $C_{32}H_{47}NO_{12}$, mol. weight 649. The platinum salt was found to be too unstable to afford accurate analytical results.

Regarding both the base and its salts, Jürgens has considerably extended our knowledge. His statements in respect to the crystalline form of the alkaloid are such that it will hardly be possible to establish a distinction between *aconitoxine* and any other alkaloid of aconite that may possibly exist. In fact, Jürgens' aconitoxine crystallizes in different forms. From an ethereal solution it is deposited in columnar crystals. If thin layers are evaporated, however, rhombic plates and hexagonal crystals are sometimes formed. Evaporated from chloroform, it is left behind in form of flattened warty crusts; from alcoholic solutions it separates in rather large prisms, sometimes grown together.

It is of particular interest that Jürgens' aconitoxine, when applied to the tongue, produces only the peculiar pricking and benumbing sensation characteristic of aconite, while it was entirely free from bitterness. Jürgens found the melting point to be at 179° C. (354° F.) [Duquesnel at 183° C.]. He also confirms the statement that the alkaloid can be precipitated by bicarbonate of sodium; and he further announces that it gives no color reaction with phosphoric acid. The latter is to be attributed to certain impurities, the presence of which is easily accounted for by the existence, in the drug, of a brownish-black resinous body.

Of particular interest are the exact determinations of solubility. Jürgens found them to be as follows:

1 in 39.22, for ether of spec. gr. 0.728.
1 in 63.90, for ether of sp. gr. 0.720.
1 in 37.04, for absolute alcohol.
1 in 23.78, for 90% alcohol.
1 in 28.06, for petroleum ether of sp. gr. 0.600.
1 in 5.50, for benzin.
1 in 726.4, for water.

Chloroform dissolves the alkaloid still more easily than benzol, and methyl-alcohol more easily than 90% ethylic alcohol. The pure alkaloid, according to Jürgens, has scarcely any optical properties, polarizing only slightly to the left; on the other hand the aqueous solutions possess this property in an eminent degree.

Of reagents, aqueous solution of iodine is, according to Jürgens, the most delicate, appearing in dilutions as high as 1 in 20,000. It produces a kermes-colored precipitate which, however, disappears after a few hours. Bromine water, iodo-hydrargyrate of potassium, iodide potassium with iodine, bromide of potassium with bromine, and iodide of potassium and bismuth still produce precipitates in dilutions of 1 in 10,000. Chloride of gold, phosphotungstic and phosphomolybdic acid 1 in 5,000; picric acid 1 in 4,000; tannic acid and nitrite of potassium 1 in 2,000. Pure aconitoxine reduces, according to Hager, neither salts of silver, nor chloride of gold or of platinum. If a few grains of aconitoxine are introduced into a 4-percent solution of corrosive sublimate in 50% alcohol, and the mixture carefully warmed, the granules are colored yellow, but the color disappears on further heating, and the solution either remains clear or, when much concentrated, yields a white precipitate. No oxide of mercury is separated as in the case of atropine and pseudaconitine.

* From an abstract of the author's paper (published in the Pharm. Zeitschr. f. Russland), by Prof. Theod. Husemann, in the Pharm. Zeitung, No. 51.

Detection of Minute Traces of Nitric Acid.

A SOLUTION of pyrogallol is added, and then 10 to 12 drops of concentrated sulphuric acid, so as to form two layers in the test-tube. The presence of nitric acid is indicated by a brown color—or yellow if the quantity is smaller—where the two layers meet. A tenth of a milligramme of nitric acid in a liter of water can be detected with certainty.—O. CURTMAN, in *Zeit. Anal. Chem.* and *J. Chem. Soc.*

[ORIGINAL TRANSLATION.]

The Relative Merits of the Principal Urinary Tests.

PROF. F. PENZOLDT, of the University of Erlangen, has recently issued the second edition of a pamphlet containing a critical review of the principal urinary tests.* As the results obtained by the author are of considerable practical importance, not only for the physician, but also for the pharmacist, who is often called upon to assist the physician in urinary examinations, we shall abstract such portions of the pamphlet as are of especial interest.

I. TESTS FOR SUGAR IN URINE.

Most of the tests for sugar in urine do not furnish the requisite proof that the kind of sugar found is in reality grape-sugar. And those which afford this proof are not sufficiently simple to be rapidly or conveniently used at the bed-side. In using the former, therefore, it must be borne in mind that any positive results do not afford an absolute proof, but merely a high probability that there is glucose present. This is especially the case with the different reduction tests, as well as several others to be mentioned. Whenever these yield a doubtful or indistinct result, it is necessary to have recourse to a more circumstantial, but at the same time more reliable test. Under all circumstances, however, is it necessary to carry out the manipulations strictly in accordance with the directions.

A. *Reduction Tests.*

1. *With Sulphate of Copper and Solution of Potassa* (TROMMER'S TEST).

This is probably the one most frequently employed and is performed as follows:

The urine is mixed with about one-third of its volume of officinal solution of soda or potassa ["officinal" referring here to the German Pharm., according to which both of these solutions contain about 15% of the alkali—KHO, NaHO—], then a 10% solution of sulphate of copper is added in drops, while shaking, as long as it is completely dissolved, and the whole heated to boiling. If glucose is present, there is formed, long before the liquid boils, a deep yellowish-red precipitate in the upper layer of the liquid. The heating is now stopped, and the reaction rapidly proceeds to the end on its own accord, the result being that cuprous oxide separates, either hydrated, in which case it is yellowish-red, or anhydrous, when it is red. Protracted heating is to be avoided, as this may cause a black coloration, due to the separation of cupric oxide and metallic copper. A mere yellow coloration, or a yellowish precipitate subsequently deposited after the liquid cools, is of no value as a criterion.

Criticism. This test suffers from uncertainty. It is true that, if a copious separation of suboxide takes place under the above-mentioned circumstances already before boiling, the presence of larger quantities of sugar in the urine becomes in the highest degree probable. But when there is little sugar present, the reaction is uncertain because the urine contains also other reducing substances. The same appearances (yellow tint of liquid, etc.) which are observed in presence of only 0.04 to 0.05 per cent of sugar also become manifest in normal urine, if not too dilute. Hence the test is not sharp enough.

2. *The Test with Sulphate of Copper and alkaline Solution of Rochelle Salt* (FEHLING'S TEST).

The method of using this test is too

* "Aeltere und neuere Harnproben und ihr praktischer Werth. Kurze Anleitung zur Harnuntersuchung in der Praxis für Aerzte und Studierende." Von Dr. F. Penzoldt, Prof., etc. 8vo, Jena, 1886.

well known to be described here. A modification for qualitative purposes, devised by Worm Müller, which has been thoroughly tested for its reliability, is as follows:

Prepare two test-solutions, namely,

1. Solution of sulphate of copper, containing 2.5% of the salt.

2. Solution of 10 parts of Rochelle salt in 100 parts of 4% solution of soda.

Put 5 C.c. of the urine into one test-tube, and 1 to 3 C.c. of the copper solution, together with 2.5 C.c. of the Rochelle salt solution, into another test-tube, heat both separately and at the same time to boiling, interrupt the boiling in both tubes at the same moment, wait 20 to 25 seconds, then pour the liquids together without shaking. If there is much sugar, cuprous oxide is separated at once; if little is present, a yellowish-green turbidity will make its appearance in a few minutes. If no results are obtained in this manner, the test is repeated with increased quantities (2, 2.5, 3, 3.5, 4 C.c.) of the copper solution.

Criticism. The Rochelle salt solution is intended to prevent the reducing action of creatinin, which interferes when Trommer's test is used. However, whether it succeeds in also preventing the action of other reducing substances (not sugar) is not proven. (For instance, in the presence of pyrocatechin it does not prevent it.) According to Worm Müller, the test indicates as little as 0.1% of sugar. Much experience is required for a correct execution of the test. If it is made with normal urine purposely mixed with 0.1% of sugar, and with a second sample of the same urine, in its natural condition, a slight difference is just barely recognizable. A great deal more difficult is the recognition if only the suspected sample is available. It would, therefore, appear necessary to test the reliability of the test still further. Moreover, it is a little circumstantial if executed as directed above. [The author speaks, of course, of Worm Müller's modified method.] It requires great care, the use of three different pipettes, and frequently one or more repetitions of the test. Yet, if the test is used without pipettes, by mere judgment of the eye (as to quantities), it serves very well as a preliminary criterion in the consultation room or at the bed-side.

3. *The Test with Subnitrate of Bismuth* (Boettger's Test).

The urine is heated to boiling, then saturated with soda, a pinch of subnitrate of bismuth added, and the mixture boiled a few minutes. If glucose is present, the liquid, or rather the precipitate, assumes a black color due to suboxide of bismuth. Carbonate of sodium is preferable to caustic soda, since the latter may produce a black color even in normal urine (Salkowski).

[Note by Ed. Am. Dr.—Boettger's recommendation was to mix 1 vol. of urine with 1 vol. of a solution of carbonate of sodium prepared from 1 part of the crystallized salt and 3 parts of water, then to add a little subnitrate of bismuth, and afterwards to boil. In presence of sugar the bismuth salt is reduced, with production of a black color (which is by some supposed to be due to metallic bismuth).

Neubauer and Vogel (*Analyse des Harns*, 8te Aufl., p. 162) append the following note to this reaction:

If caustic soda or potassa are used instead of the carbonate, the reaction proceeds more rapidly. It succeeds still better, if, instead of the insoluble subnitrate of bismuth, there is added a solution of a bismuth salt (such as nitrate of bismuth, iodide of bismuth and potassium, etc.), so that there is produced a moderate quantity of hydrated oxide of bismuth. On heating the liquid, this precipitate dissolves, and on boiling, after the liquid has already acquired a brown color, the black precipitate separates suddenly throughout the whole volume of the liquid.]

A recent modification of this method, proposed by Nylander,* is very advantageous. It is as follows:

Prepare a solution of 2.5 parts of nitrate of bismuth, 4 parts of Rochelle salt, and 100 parts of solution of caustic soda of 8% NaHO. To every 1 part of urine add 10 parts of the above solution and boil a short time. After a few minutes (even in presence of only traces of sugar) the liquid and the precipitate (phosphates) will acquire a black color.

Criticism. The ordinary Böttger's test [not Böttcher, as the author writes] has no advantage over that of Trommer. But Nylander's modification deserves attention. It seems to afford certainty up to a certain degree. Only in presence of albumin the black color is a little uncertain, owing to the possible formation of sulphide of bismuth. In normal urine it produces no result in by far the largest number of cases. Regarding the exceptions observed by Nylander, and also the author, the former believes that they may indeed be attributed to a minute quantity of sugar. There is no doubt that the test is very searching. As little as 0.1% of sugar is still very plainly detected, and this limit is perfectly sufficient in practice. Regarding handiness and convenience, the test leaves scarcely anything to be desired.

(To be continued.)

* Zeitsch. f. Physiol Chem., VIII., 175.

The Tests of Albumin in Urine.

Some time ago the Clinical Society of London appointed a committee of investigation to report upon the merits of the different tests for albumin in urine. The following abstract of the results obtained by the committee is taken from the *Brit. Med. Journ.* and *Chem. and Drugg.:*

The Committee experimented with artificial admixtures of albuminous bodies in fluids other than urine, which need not here be particularized. The general conclusion obtained from these preliminary experiments was that solution of potassio-mercuric iodide with citric acid, particularly when used after Heller's method, gives the most delicate and clearly marked reactions; and that nitric acid is, for use in the consulting-room, not inferior to any but the potassio-mercuric iodide test; its use in the two ways indicated above being taken into comparative consideration with the other tests correspondingly applied. By the use of different reagents, the Committee were able to distinguish some forms of albuminous bodies from some other states or forms; for instance, peptones from egg-albumin, or serum-albumin, or the albumin of albuminuria.

As regards the clinical use of the tests above enumerated, the committee arrived at the following conclusions.

1. Of Dr. Oliver's Test-papers, the potassio-mercuric iodide give the most delicate reactions of all the papers, and excel nitric acid, however applied. The ferrocyanide papers come next, but with a decided interval, and the tungstate papers third; whilst the picric-acid papers are less satisfactory, as an inconvenient quantity has to be used. The two first-named papers require the use of citric acid in the cold, which involves a possible fallacy, in that citric acid produces a precipitate when an excess of soluble urate is present in the urine. Urine of high specific gravity should consequently be diluted, to avoid this source of error; and sufficient acid must be added to render neutral or alkaline urine distinctly acid. The potassio-mercuric iodide papers appear to precipitate all albumins indiscriminately; but the precipitates with artificial peptones are dissolved on heating, and reappear on cooling. The ferrocyanide papers do not precipitate artificial peptones; while their reaction with other albumins is keen.*

2. Dr. Pavy's Pellets of nitric acid and ferrocyanide of potassium are reported to give as good results as the potassio-mercuric papers of Dr. Oliver (neither of these reagents being quite so searching as the *solution* of the potassio-mercuric iodide). They are stated not to precipitate peptones; and, therefore, in conjunction with the iodide solution, they may distinguish the two kinds of proteid, and, so far, help in the clinical analysis of pathological conditions. In using this test, citric acid has to be first added; and this source of fallacy must be avoided by dilution, where the specific gravity of the urine is high. Bubbles of gas, which the pellets sometimes liberate, must also be distinguished from a precipitate.

3. Dr. Johnson's Picric-acid Solution requires decided excess of the reagent, or the addition of acetic or citric acid. It is reported to be most useful, giving reactions only second to those of the potassio-mercuric iodide solution. The mixture of picric acid and urine should be boiled. Artificial peptones are thrown down by this test in the cold, but disappear upon boiling, and reappear as a cloud on cooling. The picric-acid solution should be dropped into the tube of urine, held vertically, in such a way that each drop falls upon the centre of the surface of the urine so as to obtain differentiation by the production of a film around it, if albumin be present. This cannot be managed if the solution be poured down the side of the tube, as the picric-acid solution is of low specific gravity, and highly diffusible. This gives a precipitate, not necessarily albumin, in the urines of persons taking quinine. The precipitate is distinguished by its being soluble on boiling, to reappear in a crystalline form on cooling; whilst it gives the quinine reaction with chlorine water. This test also precipitates uric acid in the cold; but this cloud disappears under heat.

4. Roberts' Brine Test is stated to be sensitive, and very trustworthy, though not quite so delicate as the other tests. It does not precipitate peptones or quinine; and it is said to allow the discrimination of mucus from albumin, the cloud of the former being superimposed upon the albuminous cloud.

5. Picric-acid Brine can be used after Heller's method, which is not possible with picric-acid solution alone owing to its low specific gravity; it gives good results.

6. Potassio-mercuric Iodide Solution, with addition of acetic acid, is the most delicate test in the list.

7. Nitric Acid, used by Heller's Method, and added cautiously, in a somewhat diluted state, to urine just boiled, is declared to be a test of great delicacy, and to be liable to fewer fallacies than the other tests considered. The drawback to this test is its difficult portability.

8. Acetic Acid, added so as to insure a decided acid reaction to urine just before, or immediately after boiling, is a delicate test.

* One apparent fallacy that might occur in the use of Dr. Oliver's papers is not noticed in the report. It happened to us once, in employing an iodide paper to test some serum drawn from a hydrocele, to find that the paper gave apparently no reaction, whereas the liquid, when boiled in another tube, became quite solid. Upon taking a paper from the first portion of the liquid, however, and examining it more carefully, it was found to be coated completely with a thick layer of solid albumin, which had apparently prevented any further egress of the salt from the paper into the liquid around, in that way frustrating all further reaction. The very sensitiveness of the test induced a belief in its failure. When, however, the serum was well diluted with water, the albuminous nature of the liquid was at once completely demonstrated by the paper. It is, perhaps, possible that the same thing might occur in a specimen of extremely albuminous urine.—Ed. *British Medical Journal.*

The report states of mucin, that it is precipitated by most of the reagents which precipitate albumin. The distinction of the two clouds, when formed by Roberts' brine test, has been already noticed; the same kind of indication is given with nitric acid, in Heller's method. With regard to the other tests, mucin cloudiness thereby obtained shows less ready sedimentation than albumin cloudiness, and exhibits a marked mobile satiny appearance of the precipitate when shaken in a good light. In some urines, the potassio-mercuric iodide and picric-acid tests produce a precipitate apparently albuminous, when nitric acid affords no such indication.

Finally, the committee think all the tests are valuable practical aids in diagnosis; that some are especially portable, and capable of application without the use of cumbrous apparatus; and that each test has a usefulness of its own. The committee consider that any one devoting himself to the thorough use of one of the tests will find it sufficiently precise for all practical needs, and that, by comparative use of several tests, the discrimination of differing forms of proteids may be obtained. The picric-acid test, which admirably detects albumin and peptones, if boiled with caustic potash, detects also the presence of sugar. The committee lastly note that the knowledge of the reaction of albumin is at present imperfect, and, possibly, capable of much improvement. But to the settlement of this question their functions did not extend.

The points, however, which were delegated to the committee for inquiry are of great practical importance to almost all classes of practitioners, and have, apparently, received a calm judicial investigation. For their labors and this report, which Dr. Ord presented on behalf of the committee, the members will receive appreciative thanks.

The subject of testing for albumin was, many years ago, considered to be settled on a fairly satisfactory basis; and those practitioners who then learned to use heat and nitric acid skilfully have, according to this report, no reason to be mistrustful of those tests. But the appearance, during recent years, one by one, of several other methods of testing, each claimed by its introducer to public favor as the "best on record," has tended rather to shake men's confidence in the tests with which formerly they had been quite satisfied. This report, happily, will go far to reassure practitioners of the excellence of those methods for ordinary laboratory work.

The Purification of Water by Alum.*

THERE is no subject which gives the manufacturer greater anxiety at times than the water which he is using in the works. Even where he is so lucky as to be located on the banks of some clear and sparkling brook, and hence is free from many of the troubles known to his less fortunate brethren, his brook may not seldom get into a troubled state and refuse to be clarified of its suspended clay and other matters by an ordinary process available to him. In no industry is this vexation from dirty water greater than in dyeing. Hence it is a matter of great importance, meaning a saving of hundreds, and sometimes thousands of dollars, to have a simple means of clearing water so that it can be used in ordinary manufacturing processes, and yet not in any way injure the properties of the water for subsequent use.

For large works which use water requiring continual purification, some constant process should be employed, as the Hyatt filter for instance. . . .

In late years an extensive use has been made of alum in the many processes of purifying water, sewage, etc. It is not improbable that, aside from its effect in precipitating matter mechanically by envelopment within the precipitating basic aluminic sulphate, the alum exerts a distinct coagulative action on the albuminous substances in the water, rendering them insoluble, and thus causing their precipitation; perhaps the same or similar effect that alum produces in the tanning of leather.

Alum has the great advantage that it is cheap, can be obtained everywhere, and is not highly poisonous. Thirty grains can be given at a dose, and the dose repeated four times a day without danger. Then again it has another very great argument in its favor, and that is its cheapness.

To get practical results from the purification by alum, it is evident that it must be added in very small amounts. The amount of alum used by Jeunet seemed to be unnecessarily high. . . .

Sixteen galls. of the city water were treated with 31 grs. of alum, and the whole allowed to stand. After forty-eight hours the precipitation seemed complete, and the bottom of the vessel was covered with a brownish, slimy deposit. This substance, after being dried, gave 59.28 per cent of ash which contained silica and alumina in relatively large amounts.

The clear water gave no reaction for alumina, showing that there was no free alum in solution.

The addition of more alum to the water failed to produce any further precipitation, showing that all the matter precipitable by alum had been thrown down.

It may hence be inferred that the addition of two grains of alum to a gallon of water will clarify it by standing. Some waters may require less, and some may require a longer standing than forty-eight hours, but this is a matter very easily determined for any particular case which may arise.

The water, after precipitation has taken place, is perfectly clear and sparkling, and has neither taste nor smell imparted to it. For use in the dye-house there can be no possible objection made to it. The most practical way of applying this method in clarifying water for use in manufacturing, where filters are not used, will be as follows: Two vats or hogsheads, or similar deep tanks, are filled with the water and treated with alum at the rate of half an ounce of alum for every one hundred gallons of water. The alum should be dissolved in a little hot water, so that it can be mixed with the large bulk of water without difficulty. The mixing can be done with a long-handled dyers' stirrer. A few minutes' stirring will suffice to mix the alum and the water very thoroughly. After the mixing has been done, the water should be allowed to stand undisturbed for forty-eight hours, or until the water clarifies, which can be easily seen by its appearance. If the clarification takes place in less time, so much the better. The water is now racked off for use. When the vat has been emptied to as low a level as is possible without disturbing the sediment, the plug in the bottom should be knocked out, and the vat cleaned out with a strong jet of water. The slimy deposit is easily dislodged and washed away by a stream of water. While one reservoir is thus being used, the other is full of water precipitating, so that the supply is continuous. The best means of drawing the water from the tanks without disturbing the sediment is about as follows: The pipe should enter the side of the vat and pass to the middle, and there be bent upwards so as to end about a foot above the bottom of the vat. The water is thus drawn downward, and no agitating of the bottom is produced. If the pipe is turned toward the bottom of the vat, the current of water will disturb the sediment.

I think that this method will be found of very great value to many works which now have trouble with their water in the rainy season, and I can call to mind offhand several which could use it to advantage. A few trials with the beautifully clear water produced by the alum treatment will make the hands feel loth to go back to the natural water even at its best. I am quite certain that many streams not now available to the manufacturer can be made so by this treatment.

* Abstract of a paper by Prof. Peter T. Austen, Ph.D., in *Textile Colorist* and *Chem. News.*

Stannous Chloride (Protochloride of Tin) as a Disinfectant.

THE use of stannous chloride as a disinfectant has been recommended by Dr. Abbot (*Med. Chron.*, June, p. 252) on the ground that it is cheap, tolerably safe, and does not corrode lead pipes. It is said to be considerably more active than zinc chloride, copper sulphate, zinc sulphate, or ferric sulphate, spores being killed after exposure to a one-per-cent solution for two hours. When required to be kept for any length of time, in order to prevent the formation of the insoluble oxychloride, it should be mixed with an equal quantity of ammonium chloride.—*Pharm. Journ.*

Vanillin.

THE physiological action of vanillin has been studied by Mr. Grasset, of Montpelier, who finds that it acts as a convulsive agent on the lower animals, causing epileptiform movements. It is, however, difficult to determine its toxic action on human beings, since as much as 10 or 15 grammes (155 to 230 grains) have been administered without noxious results. It is probable, therefore, that vanillin only acts injuriously in cases of idiosyncrasy. Indeed, Dr. Grasset suggests its use as a stimulant of an excito-muscular character in atonic dyspepsia, etc. The symptoms produced on the lower animals were found to be relieved by the subsequent administration of chloral.—*Pharm. Journ.*, July 31st.

Note on Ichthyol.

EDWARD A. ANDREWS reports in the *Pharm. Journ.* that he had been requested to make some experiments with ichthyol, in order to ascertain the best mode of application, and also to try to disguise the odor.

To attain this latter object, he tried several of the essential oils; the one that appeared to answer best was *oil of lavender*, 6 drops of this being sufficient to disguise the odor of 1 drachm of ichthyol.

He also found ichthyol to be miscible with water, glycerin, and vaseline in all proportions; oil of turpentine also mixes with it fairly well at first, but after standing some time the mixture separates into two strata, the lower one having an oily appearance and the color of ichthyol; these mix again on agitation.

About 50 minims of alcohol can be mixed with 1 drachm of ichthyol; if more spirit is used, the ichthyol will coagulate.

A plaster was made from the following ingredients:

Ichthyol	4 parts.
Lead Plaster	2 "
Resin Plaster	2 "

The preparation mostly in use, however, was an ointment prepared from:

Ichthyol	1 part.
Vaseline	1 "

Californian Honey.

AN American correspondent of the *Chem. and Drugg.* writes that the Californian honey crop of the season just terminated has been a very small one, and does not exceed two-thirds of the yield in 1884, which, for quantity, was about the best on record in that State. It is thought that the short crop is to some extent accounted for by overstocking, for in riding through the valleys and canyons of the bee-keeping region one passes a continual succession of "bee ranches," so close together that it seems a wonder where flowers are to be found in sufficient quantity to supply the bees with nectar. Some of the most successful bee-men of the State think that at least three miles should intervene between any two bee ranches, and that less than this will not allow sufficient range for the bees even in seasons as prolific of bloom as has been the present one. It is certainly remarkable that in San Bernardino county, where this theory obtains, no complaint has been noticed of any shortness of the honey yield.

Approximate Estimation of Carbolic Acid Solutions.

PROFESSOR MATTHEW HAY (Aberdeen University) suggests (*Lancet*, p. 243) a simple means for distinguishing the 1-in-20 solution of carbolic acid from the 1-in-40. Both solutions are extensively employed in surgery, and the stronger solution may be hurtful, the weaker useless, in different cases; hence the usefulness of a simple test which may be applied readily and with little trouble. The test depends upon the fact that when a five-per-cent aqueous solution of carbolic acid is mixed with an equal volume of saturated solution of common salt at the ordinary temperature, an opaque mixture is formed, due to part of the carbolic acid being thrown out of solution. It is advisable to add the acid solution to the salt solution, and if this be done (for the sake of experiment) drop by drop, it will be observed "that each drop produces a small white cloud of separated carbolic acid, which disappears at once with a single shake of the test-tube until the carbolic solution added is equal to about one-fourth part of the salt solution, when the separated acid no longer disappears on shaking. With every further addition of the carbolic solution the amount of separated acid increases, the fluid meanwhile becoming more and more opaque. The density is greatest when from three-fourth to four-fifth parts of the carbolic solution have been added to one part of the salt solution. With further addition of the solution the acid begins to be redissolved and the milkiness to disappear, and the mixture becomes almost perfectly transparent when about two parts of the solution have been added." The reaction necessary varies with temperature, a clear mixture being formed at 74° F., similarly with lower temperature somewhat weaker solutions give the same cloudiness. A 1-in-40 solution gives a clear mixture with an equal volume of the salt solution. The test is rendered more sensitive by making the salt solution with water containing one per cent of carbolic acid. Such a solution gives a cloudy mixture with carbolic acid solution of three and one-half per cent strength, and with solutions stronger than four and one-half per cent it gives cloudiness, even though the temperature be as high as 93° F. Further, a crystal of common salt will precipitate carbolic acid from a saturated (seven and one-half per cent) solution. As to liquid carbolic acid containing ten per cent of water, Professor Hay says: "It happens frequently that, for convenience, chemists prepare the carbolic solutions from liquid carbolic acid, and at least one of the best-known makers of the acid states on the label affixed to the bottle that, in dispensing the acid, the water may be disregarded. If chemists follow this instruction, and a five-per-cent solution be prepared by *weight*, it will contain only 4.5 per cent of pure acid, and will therefore not give the above reaction. If it be prepared by *volume*, as is likely in many cases, then, as the specific gravity of the liquid carbolic acid is greater than that of water, being about 1.068 (he found one specimen of Calvert's to be 1.070), a solution of greater strength is obtained, containing about 4.82 per cent of acid, and therefore of sufficient concentration to give the reaction. It is thus quite easy to distinguish by means of the reaction carbolic solutions made from liquid and from crystalline carbolic acid, if both have been made by weight."—*Chem. and Drugg.*

Salol.

THIS new antiseptic and antipyretic is a phenyl ether of salicylic acid ($HC_7H_5O_3$), the radicle phenyl (C_6H_5) replacing a hydrogen atom of the acid, thus giving $C_6H_5,C_7H_5O_3$, or more correctly $C_6H_4(OH)COO.C_6H_5$. Since its introduction, a short time ago, its action has been further investigated by Dr. Sahli, of Berne, and also by Prof. Löwenthal, who communicates a paper on the subject to the *Semaine Médicale*. It is well known that salicylic acid and its salts produce many untoward effects when administered internally, which greatly militate against their undoubted value in the treatment of acute rheumatism, and many chemists and therapeutists have long aimed at producing a substance which will possess the better properties of salicylic acid, especially its power of warding off endocarditis, without its liability to produce secondary effects. It would appear from experiments which have been made, although they are yet imperfect, that salol is such a substance. As already stated, it is a white crystalline powder, of feebly aromatic odor (recalling oil of wintergreen) and almost tasteless. Merck states that it can also be obtained in rhombic crystals, melting at 42° C. to a clear, colorless liquid, which can be cooled much below that point without solidifying, unless it be touched with a glass rod. Its freedom from taste appears to be due to its insolubility in water; it dissolves, however, perfectly and rapidly in alcohol, benzol, and ether.

Salol has been administered in doses up to eight grammes (ʒij.) per day, without bad results, and noise in the ears has been seldom observed. The dose, however, must be modified to the case, just as that of salicylic acid is; for example, in phthisical cases doses of 0.5 gramme should be used at first, because it is undesirable in these cases to lower the temperature too quickly. It is supposed that salol is unaffected in its passage through the stomach, and that it is not decomposed until it reaches the duodenum and is acted upon by the pancreatic secretion. Certainly its administration is not followed by toxic symptoms, such as would be expected by rapid absorption of phenol by the stomach. When treated with pancreatic extract, the body is resolved into its component parts; moreover, it acts as well when administered *per rectum*. The urine of patients is found to be almost black in color, due to the presence of oxidation products of phenol, consequent on the absorption of phenol products into the blood, and subsequent oxidation of these during circulation.

Salol may be applied externally as a dusting powder. Its insoluble nature makes it peculiarly applicable for this purpose, and it has been used with benefit for excoriated surfaces and fœtid wounds. It prevents the development of bacteria, but does not kill them. As a mouth wash and as an injection it is used in solution with alcohol and water, but for the latter purpose it is more desirable to suspend the finely-powdered salol in water with tragacanth or starch mucilage.

The reaction of the body with pancreatin may advantageously be employed as a test for its identity.

Dry Oleate of Quinine.

R. ROTHER recommends (in the *Drugg. Circ.*) to prepare this compound as follows:

Quinine, anhydrous	324 parts.
Oleic acid	282 "
Alcohol, Water	of each sufficient.

Mix the oleic acid with its own volume of alcohol, and gradually add the quinine, finally warming the mixture, if necessary, to effect complete combination, and filter if desirable. Expel the alcohol with a gentle heat, and incorporate a little water with the residue. Set it aside in the open air, occasionally stirring it, until the salt has become firm and perfectly dry.

Mr. Rother states that he has found the alkaloid quinine sold in the market to be the anhydrous base, and not the "trihydrite" as he at first supposed.

Characteristic Reaction of Citric Acid.

To distinguish citric from malic and tartaric acids, the following test is given by M. Mean (*Jour. Phar. d'Alsace-Lor.*): Fuse together in a porcelain crucible 1 gramme of crystallized citric acid, and 0.70 grammes glycerin, heat carefully until the mixture swells up and emits acroleine vapors, then dissolve in a little ammonia, of which the greater part is afterwards expelled by moderate heat; add two drops nitric acid (one in five) or peroxide of hydrogen (10 per cent). Citric acid thereupon assumes a beautiful green color, which changes to blue by heating. Malic and tartaric acids give no such reaction.—*Chem. and Drugg.*

The Adulteration of Olive Oil by Cotton-Seed Oil.

BY ministerial order, a commission has been appointed in Italy to inquire into the question of the adulteration of olive oil by cotton-seed oil and the best means of its detection. The commission consists of four professors of chemistry and a member of parliament.—*Chem. and Drugg.*

Knodalin is the name of a preparation introduced by Prof. Mühlberg, in Aarau, which is recommended as sure death to insects and vermin of all kinds. This compound has recently been analyzed by C. Barenthin, of Berlin (*Pharm. Zeit.*, 1886, No. 52), with the following result:

Nitrobenzol	2–3 parts.
Xanthogenate of Potassium	10 "
Potash Soap, containing about 60% water	400 "
Amylic Alcohol (crude)	600 "

The xanthogenate of potassium may have been originally added as such, or, possibly, have been formed from bisulphide of carbon employed as an ingredient.—*Pharm. Zeit.*

A Cement which is hard enough to withstand even boiling sulphuric acid may be obtained by gently melting India-rubber and adding eight-per-cent tallow while stirring. Sufficient slaked lime should be added to give to the compound the consistency of a soft paste. Twenty per cent of vermilion is now added, which causes it to harden immediately.—*Chem. and Drugg.*

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 1,755.—**The Analyst** (L.).

The editor of *The Analyst*, London, is Dr. John Muter. Address: 325, Kennington Road, London, S. E.

No. 1,756.—**Olive Tree** (F. P. Y.).

A good plate of a branch of the olive tree, both in fruit and in flower, is contained in Zippel and Bollmann's "Atlas der Ausländischen Culturpflanzen," part II., plate 5. This is natural size. You will find the work in the library of the College of Pharmacy of the City of New York.

No. 1,757.—**Pill Sugar-coating Machine** (M. E. B.).

Machines for sugar-coating pills are made by all first-class manufacturers of copper apparatus. There is no special "make" known to us as deserving particular mention. The main points are, an easy rotary motion, and a proper shape of the pan. You will find illustrations of such machines, for instance, in Remington's "Practice of Pharmacy," p. 975.

No. 1,758.—**Oil of Red Cedar** (Druggist).

"It never rains but it pours." We have had not less than three queries within about four weeks, about oil of cedar, which seems to have been comparatively uninteresting to our readers heretofore. As we have already given a full reply in our last number (August, p. 159) we must refer our correspondents (whose letters were all dated previous to their receipt of the August number by mail) to the account there given.

No. 1,759.—**Chemistry of Fermentation** (W. A.).

The best work on this subject which we are acquainted with is that of Dr. Joseph Bersch, in five volumes, containing: I. Die Hefe u. Gährungs-Erscheinungen (w. 75 illust.); II. Malzfabrikation; Malzextract; Dextrin (w. 121 illust.); III. Bierbrauerei (w. 160 illust.); IV. Spiritusfabrikation u. Presshefebereitung (w. 126 illust.); V. Essigfabrikation (w. 60 illust.). 8vo, Berlin (Paul Parey); price, 48 marks.

No. 1,760.—**Destroying Water Bugs or Roaches** (F. H. L.).

A good plan is to render the place which the water bugs or roaches frequent, perfectly dry, and then coat the boards or shelves with a strong decoction of quassia. When this has become thoroughly dry, cover the boards, etc., with clean paper. Other bitter substances may be used in place of quassia. In places where articles of food, drink, or clothing are not likely to be placed, some poisonous substance, such as corrosive sublimate, may be employed. But great care should be taken that it be not applied in such a manner that it can eventually be brushed off in dust. A good plan is to dissolve a little shellac in solution of borax, to add a very small quantity of bichloride, and to paint the solution into the cracks and corners. If water or dampness is kept away from the shelves or closets, the roaches will leave the place of their own accord.

No. 1,761.—**Cocaine** (G. G. S.).

Cocaine was discovered by Niemann in 1860, who gave it its name. It was subsequently further studied by Lossen in 1865. Gaedeke had already, in 1855, discovered in coca a crystalline substance, which is described as capable of being sublimed, and the nature of which is doubtful. He named it erythroxyline, but it is not likely that it was identical with cocaine. Recently it has been pointed out that cocaine had been first obtained in 1857, by Enrique Pizzi, Professor at the University of La Paz, in Bolivia (see this journal, June, 1866, p. 106). However, no notice of this discovery reached Europe until the present time.

Further notes on Cocaine, giving you all the information you desire, you will find in previous issues of this journal, beginning with our volume for 1884, page 230, where the discovery of its remarkable medical properties is fully detailed. The subsequent numbers of our journal contain numerous other articles which you will easily find by consulting the index.

No. 1,762.—**Spiritus Vitæ.**

A "Subscriber" says: "We have a call, once in a while, for Spiritus Vitæ, said to be an old preparation. Would like to know what it is."

We presume it is the *Spiritus Vitæ Matthioli* (*Essence de Canelle composé*) which we believe is still occasionally used in France and other continental countries, but which is hardly deserving of notice in our days. However, here is the formula:

Canella, 30 parts, Galangal, Marjoram, Mint (crisp), Cubeb, Aloe Wood (aloexylum), Ginger, Zedoary, Cloves, Nutmeg, Mace, each 15 parts; Calamus, 8 parts, Thyme, Wild Thyme, Sage, Rosemary, Red Rose, each 8 parts; Yellow Santal, Small Cardamoms, Anise, Fennel, each 4 parts; Lemon Peel, 45 parts; Alcohol (80%) 3000 parts. Distil the alcohol off the spices.

It is just possible that some confusion has arisen between the names *Spiritus Vitæ* and *Elixir ad longam vitam*. The latter used to be a preparation for which nearly as many ingredients were required as for the former. In the course of time, however, one after another of the less important constituents was dropped, until finally there emerged a rational substitute, under the officinal title, *Tinctura Aloes composita* (Germ. Pharm.), the formula of which is as follows: Aloes, 6 parts; Rhubarb, 1; Gentian, 1; Zedoary, 1; Saffron, 1 part; Diluted Alcohol, 200 parts. Prepare by maceration.

No. 1,763.—**Stills and Percolators** (M. E. B.).

B. wants to know what is the "best still." He says that all stills are "best," according to the circulars. We cannot help believing that this is, to a certain extent, true if the special features of each are taken into consideration. It is impossible to give any intelligent advice for selecting a still, unless the inquirer supplies certain data, which render the selection of one or another form preferable. Such data are:

1. What is the desired capacity of the still?

2. What is the nature of the liquids to be distilled?

3. Is steam to be used, or an open flame?

Presuming—on a guess—that our correspondent meant a small still for recovering the alcohol from small amounts of percolate, we believe that Wolff's still, or Herrick's still (see advertising pages) will answer your purpose fully. Remington's still is likewise very effective. If a steam still is wanted, many kinds and forms might be suggested, but as these are not generally kept in stock and are often ordered of varying designs and construction, we will not consume space by describing them.

The correspondent also asks us for our opinion on *Berry's Percolator*. We confess that we have no familiarity with it. Should any of our readers have had practical experience with it and favor us with a report, we should be pleased to publish it.

No. 1,764.—**Permanent Solution of Iodide of Iron** (U.).

On page 208 of our volume for 1885 we gave a formula for preparing a permanent solution of iodide of iron, for making the syrup, in which the quantity of iodine given is that required for ultimately preparing the syrup of the British Pharmacopœia. As the U. S. syrup is nearly twice as strong, it is necessary to alter the quantity of iodine as follows:

Iodine	2,574 grains.
Iron Wire	2 troy oz., or a sufficient quantity.
Distilled Water	q. s.
Solution of Hypophosphorous Acid (20%)	3 fl. drachms.

Place the iron wire and 6 fluidounces of the water into a flask, and add about one-third of the iodine. Agitate the contents briskly, until the mixture begins to become hot, when the reaction should be moderated by placing the flask in cold water, or allowing cold water to flow over it. Continue shaking the flask, and when the reaction has apparently subsided, add about one-fourth of the remaining iodine at a time, carefully keeping down the temperature by the affusion of cold water, to prevent the appearance of violet fumes. Finally, raise the contents of the flask to nearly a boiling temperature, and filter into the solution of hypophosphorous acid contained in a bottle. When the liquid is cold, add enough distilled water to make the solution measure 8 fluidounces.

This solution, when mixed with five times its volume of syrup, will produce a syrup of iodide of iron practically identical, measure for measure, with that of the U. S. Pharmacopœia.

No. 1,765.—**Archibald's Suppository Machine** (H. W. M.).

One of our subscribers wants to know how to use Archibald's Suppository Machine. [See illustration and description in NEW REM., 1879, 34.] He says that he is unable to remove the cast from the mould without breaking the suppository. He has also tried, after compression, to remove the suppository by immersing the mould in cold water; also in hot water. He also tried oiling the mould without success.

We have referred the matter to Dr. Archibald himself (of 1601 Passayunk Ave., Philadelphia), and he has supplied the following, which we publish for general information:

"In reply to your inquiry I would say, that if the moulds are dusted with Lycopodium, it will thoroughly obviate the difficulty complained of; so far as being unable to remove the cast from the mould, if he will use ordinary care in sliding the mould in a horizontal position, the suppository will remain intact in the other mould, when by simply making pressure upon the apex of the cone, a complete and perfect suppository will be the result. The same complaint has often been made to me before, and in every case where I could personally show the parties how to use them they have obviated the difficulty, and I have been and am constantly in receipt of scores of letters stating in substance that the machine is as near perfect as can be got, I myself having no trouble in the warmest weather in turning out suppositories as quickly as I would the same number of pills.

"By the way, I have added to my mould an additional appliance for making continuously nasal and urethral suppositories. So now the machine will make 15, 30, and 120 gr. suppositories, also nasal and rectal of $\frac{5}{16}$ and $\frac{1}{2}$ inch thickness. I am,

"Very truly,

"H. C. ARCHIBALD, M.D."

No. 1,766.—**Digestive Power of Pepsin** (E.).

This correspondent asks: "I would like to know why the time allowed in the U. S. Ph. test of pepsin for acting on albumen is 5 to 6 hours. I have noticed that pepsin digesting 30 grains of albumen in 6 hours, on standing 3 days longer, digested 20 grains more, or about 50 grains altogether."

The digestive action of pepsin is by no means exhausted when it has apparently ceased to act upon albuminoids in a given solution. The *pepsin ferment is not destroyed* by its peptonizing effect, but remains intact, or is at least restored to its original condition, throughout the peptonizing process. Its activity, however, depends upon the presence of a sufficient proportion of acid, as well as upon the density and dilution of the liquid. After a given amount of pepsin has apparently exhausted its effects, in a certain volume of acidulated solution, upon a given quantity of albumen, it is only necessary to dilute the liquid with a little water and to add a further small proportion of acid, in order to restore its efficacy. When the proportion of the pepsin to the volume of liquid finally becomes too small, its activity naturally is less noticeable, and may appear entirely destroyed. But as long as the liquid is kept in a perfectly aseptic condition, and as long as the pepsin ferment has not actually been destroyed or rendered inert by heat or certain chemicals, it will retain its vitality for any length of time.

The U. S. Ph. test of pepsin will require to be prescribed in more precise terms at the next revision. In testing pepsins, particularly when comparing different pepsins for their activity, it is of the utmost importance to have all the conditions under which they are examined as uniform as possible. The "hard-boiled albumen" which the pepsin is to act upon should be defined as hard-boiled white of egg, rubbed through a sieve having ten meshes to the linear inch. The time should be specified at exactly five hours, and the contents of the several vials or test-flasks should be kept in gentle motion, which may be accomplished by a simple mechanical contrivance. If it is found impracticable to agree upon an apparatus of this kind, then the vials should at least be agitated, say one minute at a time, every half-hour.

No. 1,767.—**Court Plaster** (W. D. F.).

You will find a practical working formula for this in the U. S. Pharm. (1880), under the title *Emplastrum Ichthyocollæ*. The process is, in brief, as follows, using definite weights and measures:

Dissolve 160 grains of best Russian isinglass in enough hot water to make the solution measure 4 fl. oz. Spread one-half of this, in successive layers, upon taffeta (silk-tissue) stretched on a level surface, by means of a brush, waiting after each application until the layer is dry. Mix the second half of the isinglass solution with the alcohol and glycerin, and apply it in the same manner. Then reverse the taffeta, coat it on the back with tincture of benzoin, and allow it to become perfectly dry.

The *French Pharm.* (1884), gives the following directions:

Cut 50 Gm. of isinglass into small pieces, and macerate it for 24 hours in 400 Gm. of water. Now add 400 Gm. of alcohol, and heat the mixture on a water-bath in a covered vessel. When the isinglass is dissolved as much as possible, pass the liquid through a sieve. Spread strips of black, flesh-colored, or white taffeta upon a frame, and coat them, by means of a brush, with the above-mentioned gelatin solution, kept liquid by a gentle heat. Allow to dry and apply, successively, several more coats of the same solution, until the taffeta is sufficiently coated. When dry, cut it into rectangular strips.

If the silk-tissue is not strong enough to permit stretching in a frame, it must be hemmed or bound with a braid at the edge. The best kind of brush to use is a soft, flat one. Care should be taken, in applying the first coats, that the liquid does not penetrate the fabric. It should, therefore, not be too warm; and the first coat particularly should be very thin. When finished, the plaster is best dried by exposure to a heat of about 85° F., care being taken that the drying of both sides proceeds uniformly. Hence it must neither be exposed to the sun, nor dried in an oven (Hager). The finished plaster may be smoothed by being rolled between polished steel-rollers, or pressed between plates of tinned iron.

In manufacturing the plaster on a large scale, the fabric may be kept stretched between a series of rollers, and long strips may be treated at one and the same time.

No. 1,768.—**Prescription Difficulty: Morphine and Compound Tincture of Lavender** (W. B.).

"I take the liberty of asking your advice concerning the following simple, but incompatible prescription which I dispensed a few days ago:

℞ Morphinæ Sulphatis .....gr. 1
Tinct. Lavandulæ comp.... fl. ʒ 1
Aquæ destillatæ..... fl. ʒ 7

M. Fiat solutio. S. A teaspoonful every 4 hours, if necessary.

"The mixture may be a very common one, but I had never before had occasion to prepare it. Any one who remembers having ever made the mixture states that the morphine is precipitated upon the addition of the tinct. lav. co. I sent it out after having pasted "shake-well" directions on the vial, knowing that no chemical change occurs. Was I justified in dispensing it? Or, should I have spoken to the physician in regard to the incompatibility of the mixture, so that he might substitute some other aromatic for the comp. tinct. of lavender? For, I suppose, the latter was used merely to disguise the taste of the morphine."

Regarding the incompatibility of the mixture, we have to say that there is, indeed, a chemical change produced. Our correspondent correctly surmises that the fault lies with the compound tincture of lavender, but he has evidently failed to discover the precise cause. This compound tincture contains, among other ingredients, the coloring matter of *red saunders* (Santalum rubrum). Now this coloring matter is, in some respects, a rather intractable substance. It is, in fact, an acid which is almost insoluble in water, and forms insoluble or difficultly soluble salts (so-called *lakes*) with all bases but alkalies. The precipitate, which is formed when a morphine salt is added to a liquid containing santalic acid, is a santalate of morphine which collects in reddish flocculi. When comp. tinct. of lavender is mixed with water, it becomes opalescent or turbid, owing to the separation of santalic acid, but it requires some time for the latter to separate as a precipitate. The addition of an alkaloidal salt (or a metallic salt), however, at once causes a separation of the santalate formed.

These colored precipitates are soluble in caustic alkalies, provided the base itself is soluble in the latter. For instance, morphine is soluble in caustic soda or potassa. Hence, on adding enough of either of the latter to the muddy mixture, the precipitate will entirely dissolve. Alcohol will also dissolve certain of these lakes. But neither method is suitable for use in prescriptions.

Regarding the other points of the query, we think our correspondent ought to have notified the prescriber before sending out the mixture. If the physician could not be reached, then he was perhaps justified in dispensing it with a "shake" label.

No. 1,769.—**Pyrophosphate and Phosphate of Iron in Mixture with Phosphoric Acid** (D. E. S.).

We have often had inquiries regarding the troublesome combination of the pyrophosphate and phosphate of iron with phosphoric acid, in mixtures, and have replied to them at length. But it seems that this is a constantly recurring trouble and needs to be frequently explained. We will try to convey our information in a different way this time.

There are three kinds of phosphoric acid:

Metaphosphoric Acid.
Pyrophosphoric Acid.
Orthophosphoric Acid.

The officinal phosphoric acid is the orthophosphoric acid, distinguished, among other things, by the fact that it does not precipitate tincture of iron and does not coagulate albumen or gelatin.

The pyrophosphoric acid does not interest us much as an acid, as it is not a commercial article; but the other phosphoric acids are liable to contain it as an impurity. It gives a precipitate with chloride of iron, but does not precipitate albumen or gelatin.

Metaphosphoric Acid is obtained by dissolving oxide of phosphorus in water, or by heating the other phosphoric acids until no more water is given off. This is available in commerce as *glacial phosphoric acid* but it is rarely found pure, being demanded by consumers in sticks, in which form it can be best cast when mixed with a certain proportion of phosphate of sodium.

Pyrophosphate of Iron is precipitated as a gelatinous mass by the officinal or orthophosphoric acid.

Phosphate of Iron is likewise more or less decomposed and rendered gelatinous (after a while) by the officinal acid.

Both salts, however, are perfectly soluble in, or miscible with metaphosphoric or glacial phosphoric acid.

Consequently the following rule should be followed:

When Pyrophosphate or Phosphate of Iron are ordered in a mixture together with Phosphoric Acid, do not use the officinal acid, but one freshly prepared from glacial acid.

The glacial acid not being pure, or of uniform strength, it is impracticable to do more than to approximate the required strength. By using the following proportions, an average strength, equivalent to the officinal acid, will generally be obtained:

Diluted Phosphoric Acid (from glacial).

Glacial Phosphoric Acid..... ....grs. 60
Distilled Water, enough to make, fl. oz. 1

This should be freshly made when wanted, or at least should not be kept too long in stock, as it is apt gradually to change in part into orthophosphoric acid.

On the other hand, when tincture of chloride of iron and phosphoric acid are prescribed together, *always* use the officinal acid.

Now we turn to the query of our correspondent, who sends us the following prescription:

℞ Ferri Pyrophosphatis. .. .. ʒ 1
Strychninæ Sulphatis.....gr. 1
Aquæ..... .. ..fl. ʒ ½
Acidi Phosphor. dil..... fl. ʒ 2
Syrupi Zingiberis.....q. s. ad fl. ʒ 4

This is prepared simply by dissolving the pyrophosphate and the strychnine salt in the water, then adding the diluted phosphoric acid, prepared from the *glacial acid*, as above directed, and finally adding the syrup,

No. 1,770.—**Javelle Water and Labarraque's Solution** (W. J.).

The former is a solution of hypochlorite of potassium with chloride of potassium:

$$KClO + KCl$$

and the latter is a similar compound, the potassium being replaced by sodium. As you are aware, the latter is officinal under the title *Liquor Sodæ Chloratæ*.

The term Javelle water is derived from the fact that the above-named compound was first prepared at the chemical works of Javelle—a locality at the outskirts of Paris, on the road towards St. Cloud, where mills and other factories are located. In fact, this solution, first prepared at Javelle in 1792, was the first known bleaching liquid. It may be prepared in several ways. Chlorine gas may be conducted into a cold solution of 1 part of potassa in 8 parts of water, until the liquid begins to effervesce. Chloride of potassium is separated in small crystals, and, if common potash has been used, silicic acid is also thrown down. When the liquid was first introduced, it was always of a light rose-red tint, due to an accidental admixture of manganese salt, derived from the vessel in which the chlorine gas was generated. Subsequently it has probably become customary—according to Lunge—to add a little of the manganese residue, on purpose, in order to give it the accustomed tint.

It is, however, more rational to prepare a solution free from such artificial tint. And, moreover, it may be prepared much more readily by a process similar to that employed for the officinal solution of chlorinated soda, namely:

Liquor Potassæ Chloratæ.

Solution of Chlorinated Potassa.

(Javelle Water.)

Carbonate of Potassium. 58 parts.
Chloride of Lime.....80 "
Water .....a sufficient quantity.

Mix the chloride of lime contained in a tared flask with 400 parts of water. Heat the carbonate of potassium, in another flask, with 300 parts of water to boiling, and pour the hot solution into the mixture first prepared. Shake well, cork the flask well, and set it aside to cool. When cold, add enough water to make the contents weigh 1,000 parts. Allow to settle, and separate the clear solution by means of a siphon, or pass the liquid through a muslin strainer.

The clear liquid obtained as a product has the specific gravity 1.050.

Regarding Labarraque, the following brief notice will probably suffice:

Antoine Germain Labarraque was born at Oléron (Departm. Basses-Pyrénées), on May 29th, 1777; became elève en pharmacie in 1801, passed his examination June 8th, 1805, subsequently became Member of the Conseil général de Salubrité and Knight of the Legion of Honor; also Member of the Academy of Medicine and of other societies. He was the author of several important publications, his most meritorious discovery being the fact that the effluvia caused by animal matter in a state of partial decomposition could be immediately destroyed by chlorine gas. The first impulse to his investigations was due to his being consulted about means of suppressing the bad odors arising from factories of violin strings (gut). For his discoveries in this direction, he received the Prix Montyon (of 3,000 francs) from the French Academy of Sciences, on June 20th, 1825. He died in one of the suburbs of Paris, Dec. 9th, 1850.

No. 1,771.—**Helenin** (J. W. and Dr. P.).

The following notice, taken from Merck's trade circular, contains the information you desire:

Helenin or *elecampane camphor* ($C_6H_{10}O$) appears in form of colorless, neutral crystalline needles, melting near 110° C. It is almost insoluble in water, easily soluble in hot alcohol ether, fatty and ethereal oils.

Elecampane has long been reputed to be a gentle stimulant, diaphoretic, and expectorant, but until a short time ago it was little used by the regular profession. Recently it appears to attract more attention again, to judge from the increased demand. Dr. Korab has observed that helenin is an antiseptic, capable of destroying bacilli, particularly those of tuberculosis, and he therefore believes it will be found useful as a remedy in phthisis, malaria, and catarrhal diarrhea. The same observer states that 1 part of helenin will preserve 10,000 parts of urine from decomposition.

Dr. Valenzuela has obtained excellent results with it in whooping-cough. Chronic (?) bronchitis always (?) yielded to the use of helenin. Constant effects of the latter are a diminution of the cough, shortness of breath, and pain. It also acts as a tonic to the digestive organs; hence it may be given even to consumptives afflicted with severe diarrhea.

The dose of helenin is given as 0.01 Gm. (⅛ grain) ten times a day. It may be given in alcoholic solution (1 in 5) in doses of 5 drops three times daily.

In the Hôpital Tenon at Paris, there is employed an antiseptic dressing called "hélénol du Dr. Korab," which Merck believes to be an alcoholic solution of helenin.

The price of helenin, in small quantities, on the New York market, is about fifty cents a gramme.

No. 1,772.—**Sparteine** (N.).

This alkaloid was discovered by Stenhouse in 1851, in Broom (*Spartium Scoparium* L.; *Sarothamnus Scoparius* Koch). It is a volatile, colorless, viscid liquid having an odor resembling that of aniline, and very bitter. It is strongly alkaline, and but little soluble in water.

The *sulphate of sparteine* has recently been introduced into medicine as a cardiac tonic. The dose is given as 0.10 Gm. or 1½ grain. Compare our March number, p. 58.

The mode of preparation there given is rather circumstantial. It is quite likely that the method of dissolving out the alkaloid by a volatile solvent will be applicable to this alkaloid in the same manner as it is to most others. We do not speak from experience in this case, but would suggest to our correspondent, who asks our advice in the matter, to exhaust broom with water acidulated with sulphuric acid, to concentrate the solution, having previously neutralized so much of the excess of acid as will leave the residuary liquid still distinctly acid. Next, the concentrated liquid is to be made strongly alkaline by caustic soda, or perhaps better, carbonate of sodium, and the free alkaloid dissolved out by shaking with ether or chloroform, in both of which it is soluble. From this solution, it may then be obtained as a sulphate or other salt by shaking it with an aqueous solution of the corresponding acid. The salt thus obtained will probably need purifying by one or more recrystallizations, possibly with the intervention of animal charcoal to remove the last traces of coloring matter. We should be glad to learn whether our correspondent will have success with this method or not.

Information Wanted.

1. Composition of "Indian Paste."

2. "Acetated Castor Oil." What is the formula for its preparation?

CORRESPONDENCE

Prescription Difficulty.

(See Query No. 1,730 in July number.)

MR. GEORGE W. SLOAN, of Indianapolis, favors us with the following communication:

Editor American Druggist, New York:

In your last issue (July) I find "A difficult prescription," 1,730, and after giving the same as follows:

℞ Morphia Sulph..... ...gr. iij.
Tannic Acid.....gr. xl.
Acid Carbol .....gr. 20
Butyr. Cacao.....q. s.

Fiat suppositories No. x.,

the statement is made that this cannot be put up—which may be true if followed to the letter; if, however, the operator will allow himself a little latitude and use the following method, he will get fair results, at least such has been my experience.

Let him take forty grains of powdered elm, and incorporate the acid carbolic with this; then, with a portion of the cacao butter *grated*, incorporate the morphia sulph., and in a like manner the tannin, using a pill tile and spatula. Afterward the three may be intimately mixed and the suppositories formed by cold pressure.

The powdered elm absorbs the acid carbolic very nicely, and there is no objection to its use, and the mixing of the morphia salt and tannin with the cacao butter in separate portions protects them mechanically from any chemical reaction.

Inclosed find sample as for above method.

I have had a similar recipe to fill many times. Very respectfully,

GEO. W. SLOAN.

INDIANAPOLIS, IND., July 15th, 1886.

BIBLIOGRAPHY.

GENERAL INDEX TO THE YEAR BOOK OF PHARMACY for the years 1864 to 1885 inclusive. London: Published for the British Pharmaceutical Conference by J. and A. Churchill. 1886. pp. 246. 8vo.

THE compiler of this valuable index is not named, but the work appears to be well executed, and will be found of great assistance to those who may have occasion to examine the literature of pharmaceutical subjects. It is published in a style uniform with the series to which it relates.

DRUGS AND MEDICINES OF NORTH AMERICA, by J. U. LLOYD and C. G. LLOYD. Cincinnati, 1886. $1 per year.

THE first number of vol. II. of this valuable quarterly publication relates to the *Liriodendron tulipifera* or tulip tree, and to several varieties of the *Magnolia*. The illustrations are numerous and compare favorably with those which have preceded them.

PROCEEDINGS OF THE FIFTH ANNUAL MEETING OF THE MASSACHUSETTS STATE PHARMACEUTICAL ASSOCIATION, pp. 232. 8vo.

THIS handsome report gives a very complete account of the working of the Association, and contains much valuable matter of a scientific character. Notice is given that this and previous réports are for sale at the price of 25 cents for that of 1882, and 50 cents for the volumes of succeeding years.

Woodward, C. J. Arithmetical Chemistry; or, Arithmetical Exercises for Chemical Students. Part I., second edition. 12mo. Birmingham, 1 sh.